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Appendix  
Traffic Assessment Report

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Wellesley, Massachusetts

# Hunnewell Elementary School

*March 2020*

## TRAFFIC ASSESSMENT REPORT

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**Hunnewell Elementary School**  
Wellesley, Massachusetts

## **TRAFFIC ASSESSMENT REPORT**

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Prepared by: **BETA GROUP, INC.**  
Prepared for: **SMMA**

March 2020

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## 1.0 INTRODUCTION

As requested, BETA Group, Inc. (BETA) has evaluated the existing and future (years 2023 and 2026) traffic conditions at study intersections in the vicinity of the Hunnewell Elementary School in Wellesley, MA. BETA collected new vehicle, pedestrian and bicycle counts at seven study intersections during the school arrival and dismissal periods; conducted an 11-hour parking occupancy survey of public spaces in the study area; and observed operations and traffic circulation at the school during the arrival and dismissal periods. Future conditions were evaluated for both the existing school without redistricting of students (No-Build) and with a new Hunnewell School with additional redistricted students (Build). Two future conditions were evaluated: Year 2023 represents an “Early” completion year for a new Hunnewell School and Year 2026 represents a “Late” completion year. Both future conditions assume full enrollment and new redistricting. Below is a summary of the existing and future transportation conditions.

## 2.0 EXISTING CONDITIONS

### 2.1 HUNNEWELL SCHOOL CHARACTERISTICS

The school doors open at 8:30 AM on weekdays and students and parents start arriving around 8:15 AM. School ends at 3:05 PM on Monday, Tuesday, Thursday and Friday, and at Noon on Wednesday. Students enter and leave through the front doors. The following is a summary of current school staff and students:

- 35 full-time staff and 10 part-time staff
- Kindergarten: 40 students
- 1<sup>st</sup> Grade: 44 students
- 2<sup>nd</sup> Grade: 43 students
- 3<sup>rd</sup> Grade: 41 students
- 4<sup>th</sup> Grade: 49 students
- 5<sup>th</sup> Grade: 47 students
- Total: 264 students

. The following shows student mode of arrival to school based on a recent school survey:

- Auto Drop-Off: 60 students in 45-50 autos
- Park and Walk: 70-80 students
- Most of the 4<sup>th</sup> and 5<sup>th</sup> grade students (96) walk by themselves to school. K-3 must be accompanied by a parent to walk to school
- Kindergarten and 1<sup>st</sup> grade students generally park and walk with a parent to school
- 2<sup>nd</sup> and 3<sup>rd</sup> grade students arrive by a combination of drop-off and walk and park
- Up to 10 students ride bicycles to school when the weather is nice in the fall and spring

During the winter, the number of students arriving by auto increases. Also, during the winter, up to 10 families will pick up students early on Friday for ski trips.

The Wellesley School Safety Officer monitors parking conditions in the Library Lot once a week during an arrival or dismissal period. They turn parent vehicles away if no spaces are available.

Hunnewell School is not a formal participant in the MassDOT Safe Routes to School Program. However, the school holds many informal Safe Routes to School events to encourage students to walk to school. The school provides transportation and safety information to parents at the beginning of school in the fall

and on the school's website. The school indicated that 162 students walked to school on National Walk to School Day (October 3, 2018).

The following buses serve Hunnewell School:

- Wellesley Hunnewell Bus: Arrival 5 students; Dismissal 2-3 students
- Wellesley METCO Bus: Arrival and Dismissal 13 students
- Wellesley Mini-van: Arrival and Dismissal 5-7 students
- Wellesley Community Children's Center: Dismissal up to 25 students

## **2.2 HUNNEWELL SCHOOL ACCESS AND CIRCULATION**

**Figure 1** shows the location of Hunnewell School with the surrounding roadway network, study intersections, and parking areas. Cameron Street provides access to the front door of the school. School buses and vans park on Cameron Street in front of the school for school arrival and dismissal. Parents park along the east side of Cameron Street during the school arrival and dismissal periods. Near the Library driveway on Cameron Street there is a flashing beacon ("Do Not Enter When Lights Flashing") and sign to prevent southbound travel during school arrival and dismissal periods. The "Do Not Enter" hours are 8-9 AM Monday-Friday; 2:45-3:45 PM Monday-Tuesday and Thursday-Friday; and 11:30 AM-12:30 PM Wednesday. It is noted that all Wellesley Elementary schools have early release on Wednesdays. On-street two-hour parking is allowed on the east side of Cameron Street, south of the south school half-circle driveway. On-street parking is prohibited on Cameron Street in front of the school, except for school buses and vans. On-street parking is allowed on the east side of Cameron Street, north of the school half-circle exit driveway only during school arrival and dismissal. Parking is not allowed on the west side of Cameron Street at any time. Sidewalks are provided on both sides of Cameron Street.

**Figure 1: Study Area and Intersection Turning Movement Count Locations**

There is a half-circle driveway in front of the school that allows one-way counterclockwise (northbound direction) travel. "Do Not Enter" signs prohibit vehicular entry into the south driveway (entrance) between 8 and 9 AM. There are eight striped parallel parking spaces on the inside of the circle. The spaces are for general use as there are no signs posted. Most of the vehicles parked in these spaces were teachers and staff, although some visitors were observed parked in these spaces. The north school driveway (exit) is posted with a "Do Not Enter" sign.

Access to the main school teacher and staff parking lot is provided by a driveway on the east side of Cameron Street, north of the half-circle driveway. This driveway also provides access to the Library parking lot. An additional access roadway to the Library is provided from Washington Street. The access to the Cameron Street Parking Lot is provided via a driveway on Cameron Street that is the east leg of a four-way unsignalized intersection with Spring Street. Travel in the Cameron Street Lot is one-way, counterclockwise from the access road to the Lot.



Traffic Circle Parking at  
Front of School

## 2.3 SIDEWALK INVENTORY

A sidewalk inventory was performed within the study area on Friday, February 14, 2020. The inventory was conducted within 600 feet of Hunnewell School which includes the entire length of Cameron Street between Washington Street and Hampden Street. The inventory also included sidewalks between Hunnewell School and the Wellesley Square MBTA Station (Washington Street, Grove Street and Railroad Avenue), which is the nearest public transportation station. The inventory recorded sidewalk condition,

width, material, deficiencies and any gaps in the network. A summary of the inventory is provided in **Table 1**.

**Table 1: Sidewalk Inventory**

	Width	Material	Condition	Comments
<b>Cameron Street</b>				
Hampden St to Brook Path				
East	4 - 5'	Asphalt	Fair	Alligator, transverse, longitudinal cracking
West	5'	Asphalt	Good	Some Cracking due to tree roots
Brook Path to School Grounds				
East	4 - 5'	Asphalt	Good	
West	5'	Asphalt	Good	Utility box in sidewalk under repair
School Ground to Driveway Entrance				
East	4 - 5'	Asphalt	Fair - Good	Cracking
West	5'	Asphalt	Good	
In Front of School of Driveways				
East	4 - 5'	Asphalt	Fair	Cracking and raised utilities
West	5'	Asphalt	Good	
School Exit Drive to Library Drive				
East	4 - 5'	Asphalt	Poor-Fair	Cracking, 60 foot section in Poor condition
West	6'	Asphalt	Good	
Library Drive to Washington Street				
East	4 - 5'	Asphalt	Fair - Good	Cracking
West	6'	Asphalt	Fair - Good	
<b>Washington Street</b>				
Cameron St to Grove St				
North	8'	Concrete	Good	
South	8-18'	Concrete	Good	
<b>Grove Street</b>				
Washington St to Post Office				
East	6-13'	Concrete/Asphalt	Good	
West	N/A	N/A	N/A	
<b>Railroad Avenue</b>				
Grove St to Station Driveway				
North	5'	Asphalt	Good	No sidewalk through station parking Lot.
South	N/A	N/A	N/a	

The existing sidewalk on the Hunnewell School side (east) of Cameron Street is asphalt, generally between four and 5 feet wide and ranges from good to poor condition. Along the school frontage, the sidewalk is generally only in fair condition with one short section in poor condition. Except for the accessible pedestrian ramps on Camron Street at Brook Path, none of the pedestrian ramps along the sidewalks inventoried have detectable pedestrian panels for the site impaired.

## 2.4 TRAFFIC, PEDESTRIAN, AND BICYCLE INTERSECTION VOLUMES

Intersection turning movement counts were conducted at the following seven study intersections on Tuesday, September 25, 2018 between 7:00 and 9:00 AM and 2:00 and 4:00 PM:

1. Washington Street (Rte 16) at Grove Street / Central Street (Rte 135) - Signalized
2. Washington Street (Rte 16) at Cameron Street – Signalized
3. Washington Street (Rte 16) at Library Driveway - Unsignalized
4. Grove Street at Spring Street - Unsignalized
5. Grove Street at Hampden Street - Unsignalized
6. Cameron Street at Hampden Street - Unsignalized
7. Brook Street at Hampden Street - Unsignalized
8. Washington Street (Rte 16) at Wellesley Avenue (counted December 2016) - Signalized

There were issues with video recording cameras at the intersections of #2 Washington Street/Cameron Street and #3 Washington Street/Library Driveway, so they were recounted on Thursday, October 4, 2018 between 7:00 and 9:00 AM and 2:00 and 4:00 PM.

Turning movement counts were conducted at the intersection of Washington Street and Wellesley Avenue on Thursday, December 15, 2016 between 7:00 and 9:00 AM and 2:00 and 4:00 PM. These volumes were increased by 1.0% per year to establish a baseline 2018 condition consistent with the other seven traffic count locations.

### 2.4.1 SEASONAL ADJUSTMENT

The need for Seasonal Adjustment of the traffic volume date collected in September and October was explored based on historical MassDOT traffic data. It was determined that volume in the months of September and October are generally higher than the average month. To be conservative, the seasonal adjustment was not applied.

### 2.4.2 PEAK HOURS

These time periods were chosen to capture the peak school arrival (8:30 AM) and dismissal (3:05 PM) periods. While each intersection has its own peak hour, overall peak traffic volumes generally occurred between 7:30 and 8:30 AM and 2:30 and 3:30 PM. **Table 2** provides a summary of intersection peak hour start times for vehicles and pedestrians. In addition, the Table lists the calculated intersection Peak Hour Factor (PHF) for vehicular peak hours. The PHF measures the variation in traffic throughout the hour separated into 15-minute intervals. Ranging from 0.25 to 1.0, a high PHF suggests stable volumes throughout the entire hour. While a low PHF suggests that most volume occurs in one 15-minute period but is very light during the rest of the hour. Within the study area, the PHF was generally found to be higher than 0.75, which is expected for these types of roadways.

**Table 2: Intersection Peak Hour Summary**

LOCATION	AM Peak Hours		PM Peak Hours	
	Vehicles	Bike/Peds	Vehicles	Bike/Peds
1. Washington Street (Rte 16)/Grove Street /Central Street (Rte 135)	7:30 AM (0.97)	8:00 AM -	3:00 PM (0.98)	3:00 PM -
2. Washington Street (Rte 16)/ Cameron Street	7:45 AM (0.88)	7:45 AM -	2:30 PM (0.97)	2:00 PM -
3. Washington Street (Rte 16)/ Library Driveway	7:45 AM (0.88)	7:45 AM -	2:30 PM (0.96)	2:00 PM -
4. Grove Street/ Spring Street	7:45 AM (0.92)	8:00 AM -	3:00 PM (0.85)	2:00 PM -
5. Grove Street/ Hampden Street	7:30 AM (0.90)	8:00 AM -	2:45 PM (0.89)	3:00 PM -
6. Cameron Street/ Hampden Street	7:30 AM (0.75)	7:45 AM -	2:30 PM (0.82)	2:30 PM -
7. Brook Street/ Hampden Street	7:30 AM (0.87)	7:45 AM -	2:30 PM (0.95)	2:00 PM -
8. Washington Street (Rte 16)/ Wellesley Avenue (Rte 135)	7:45 AM (0.97)	7:45 AM -	3:00 PM (0.97)	2:45 PM -

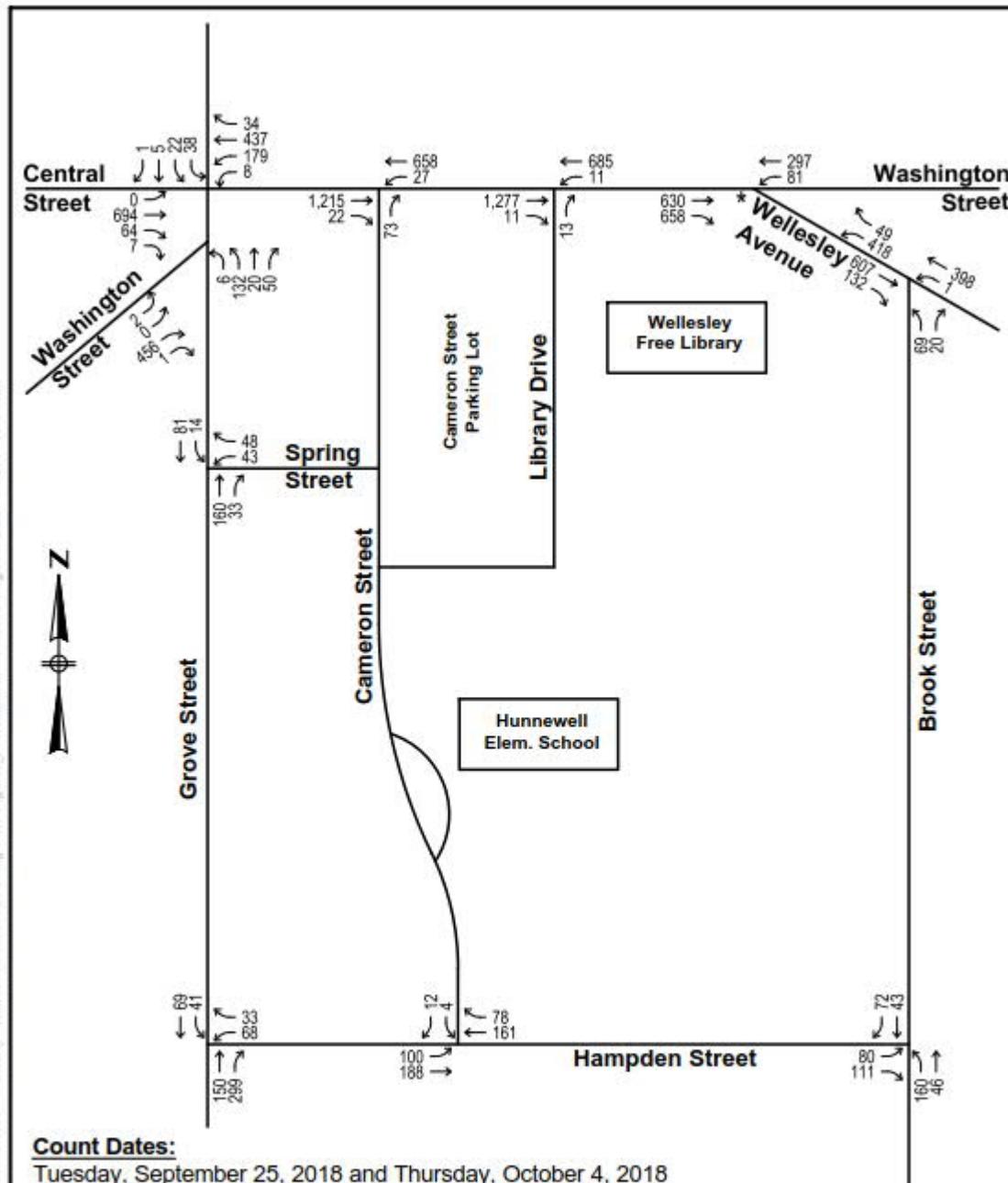
X:XX AM/PM – Peak Hour Start Time  
(0.XX) – Peak Hour Factor

#### 2.4.3 VOLUME SUMMARY

**Figure 2** and **Figure 3** show the traffic volumes in the study area for the AM and PM peak hours, respectively. Copies of the traffic volume counts are provided the Appendix.

There were generally nominal differences in pedestrian and bicycle volume when comparing the pedestrian and bicycle (only) peak hours and the vehicle peak hours listed in **Table 2**. As such, **Figure 4** and **Figure 5** show the pedestrian and bicycle volumes that occur during the AM and PM vehicle peak hours, respectively. The only major difference was found to be at Grove Street and Hampden Street where 28 pedestrians crossed from 3:00 PM to 4:00 PM, approximately 33% more than the shown in the vehicle peak hour.

**Figure 2: 2018 Existing AM Peak Hour Traffic Volumes**



### Count Dates:

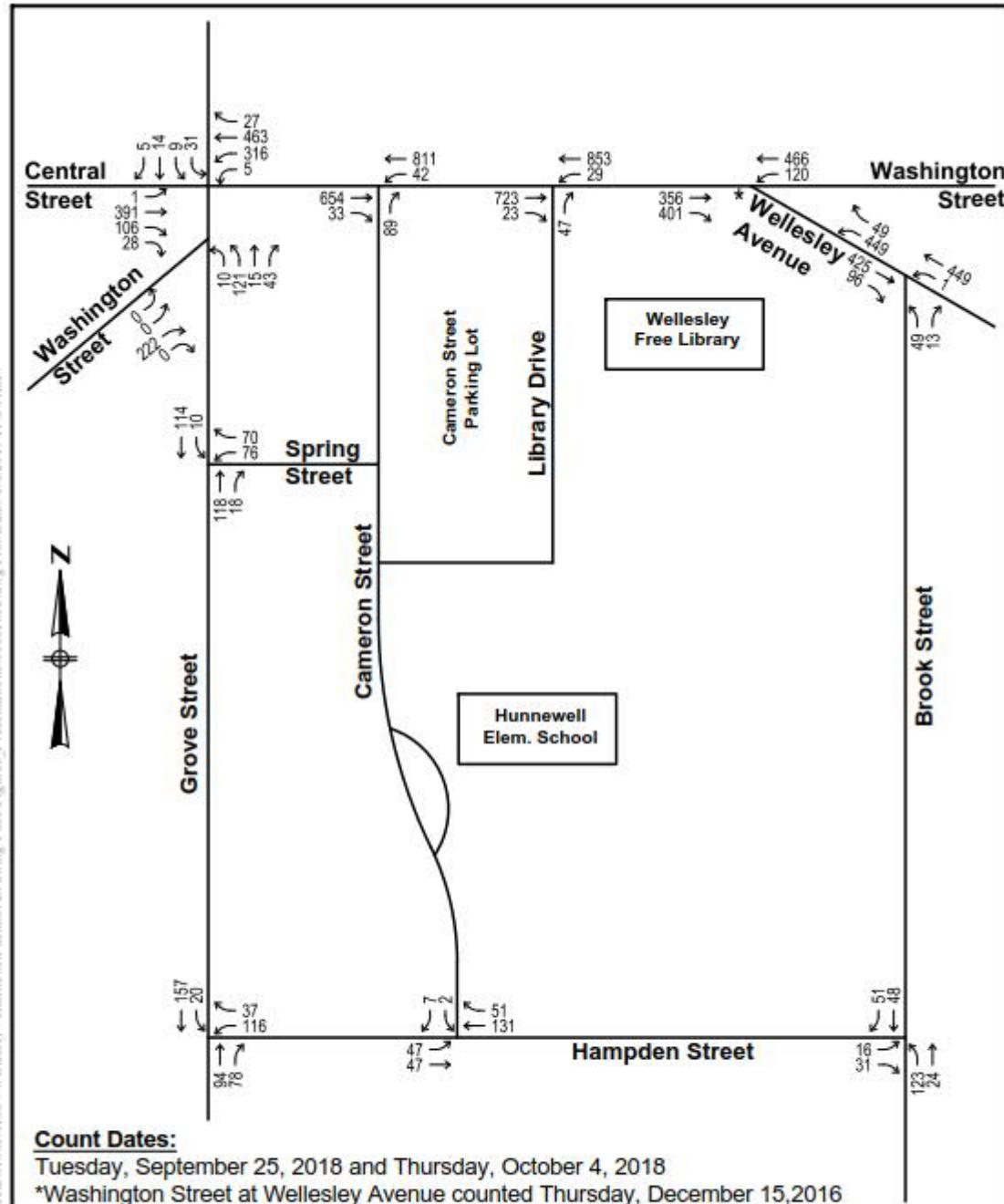
Tuesday, September 25, 2018 and Thursday, October 4, 2018

\*Washington Street at Wellesley Avenue counted Thursday, December 15, 2016



**Figure 2**  
2018 Existing AM Peak Hour  
Vehicle Volume

Figure 3: 2018 Existing PM Peak Hour Traffic Volumes



**Figure 3**  
 2018 Existing PM Peak Hour  
 Vehicle Volume

Figure 4: 2018 Existing AM Peak Hour Pedestrian and Bicycle Volumes

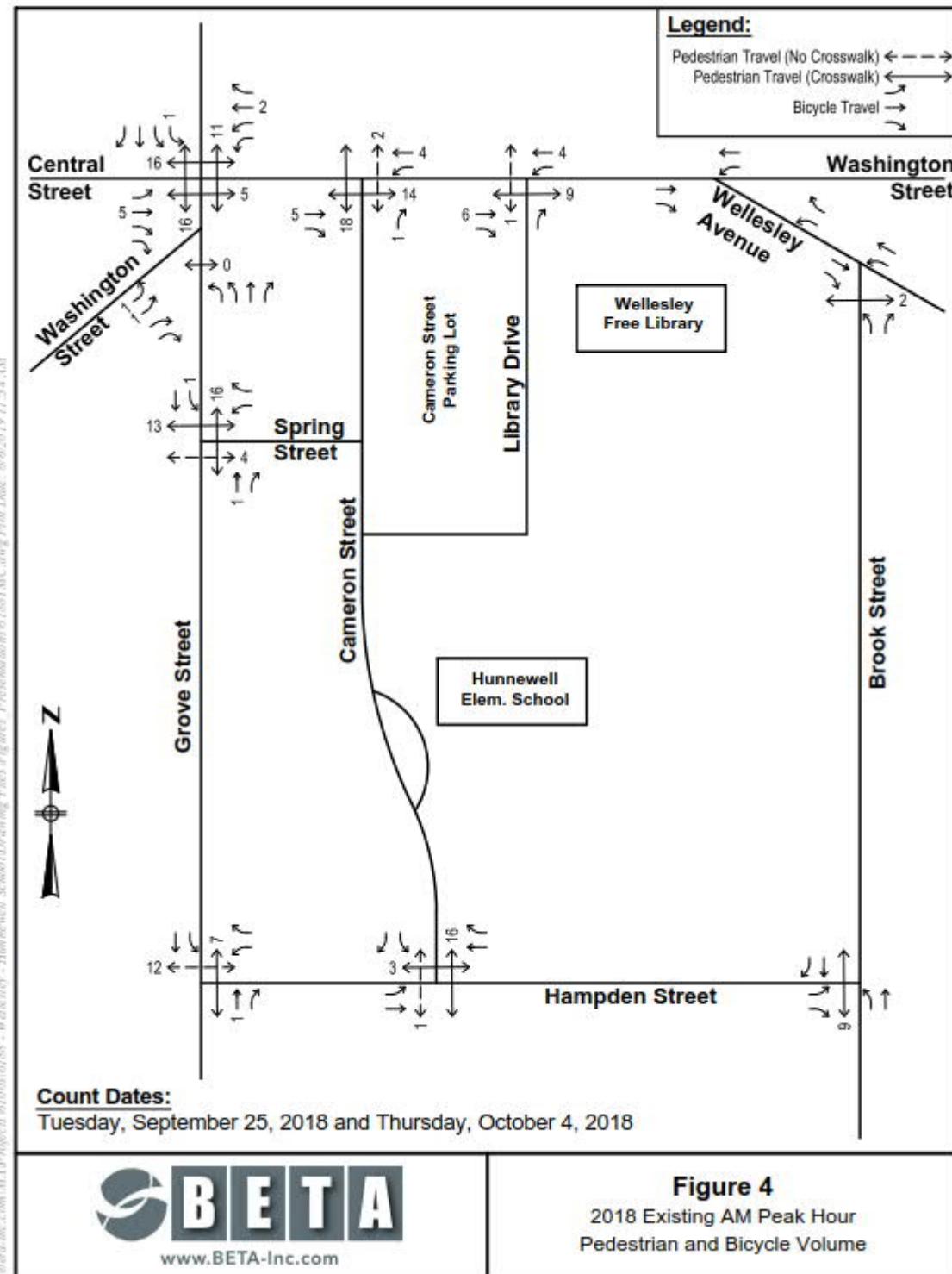
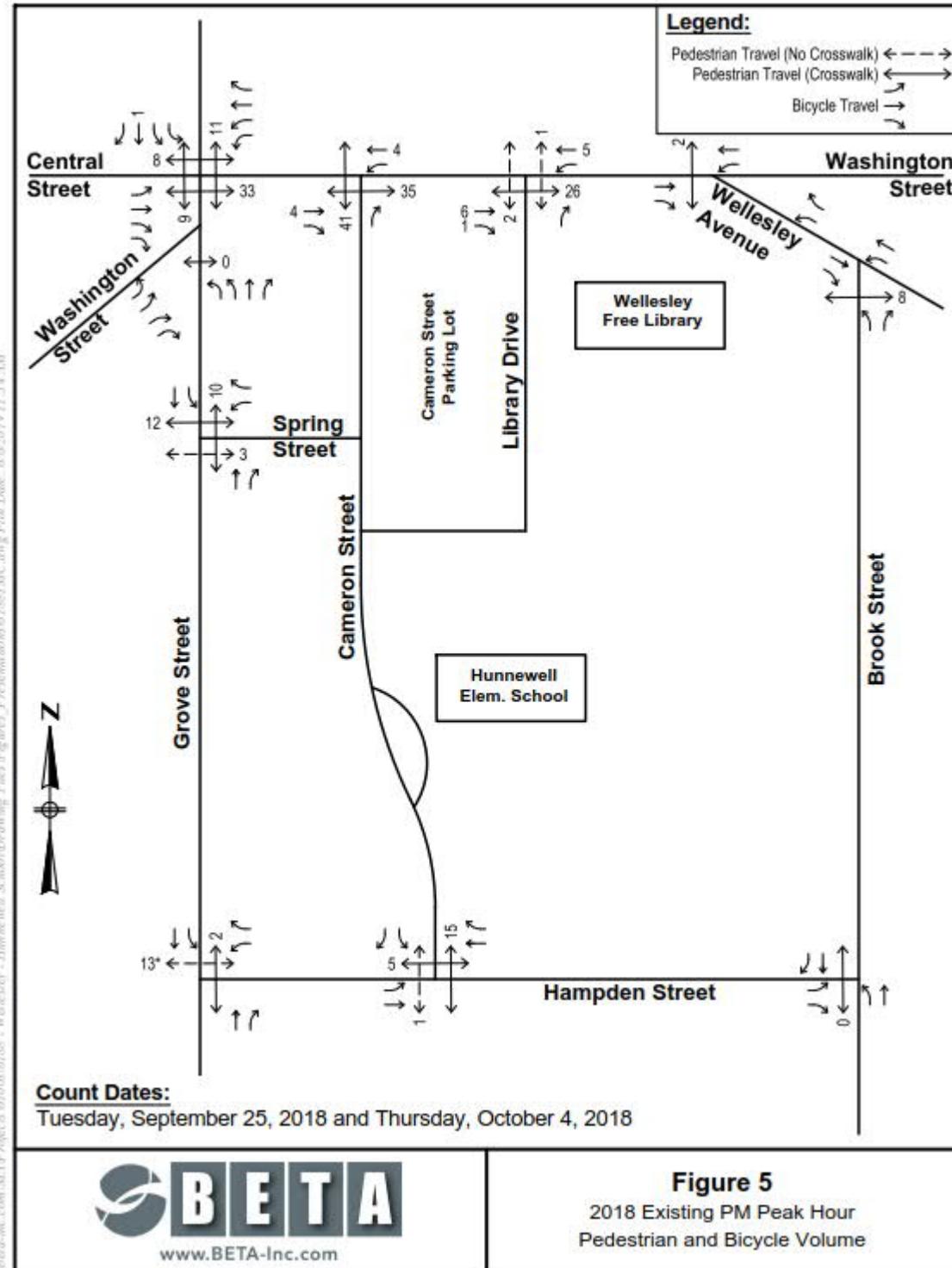


Figure 5: 2018 Existing PM Peak Hour Pedestrian and Bicycle Volumes



**Figure 5**  
2018 Existing PM Peak Hour  
Pedestrian and Bicycle Volume



The intersections of Washington Street/Grove Street/Central Street, Washington Street/Cameron Street and Grove Street/Spring Street had between 33 and 37 pedestrian crossings during the AM peak hour. During the PM peak hour, the intersection of Washington Street/Cameron Street had 76 pedestrian crossings and Washington Street/Grove Street/Central had 50 pedestrian crossings during the PM peak hour. Most of the remaining study intersections had between 10 and 30 pedestrians during the AM and PM peak hours. Between 8 and 12 bicyclists were recorded at the study intersections along Washington Street during both the AM and PM peak hours.

#### *2.4.4 AVERAGE DAILY TRAFFIC*

**Table 3** shows a summary of average daily traffic volume for three study area roadways; estimated by applying a K-Factor to the peak hour vehicle volumes shown in **Figure 2** and **Figure 3**. K-Factors were gathered from Historical Data over the course of the last 15 years on Route 135, Route 16, and Grove Street. The K-Factor represents the portion of average daily traffic occurring on a given roadway during the peak hour.

**Table 3: Summary of Daily Traffic Volumes**

Location	PHV	K Factor	ADT
Washington Street West of Library Drive	1,975	0.06 *	33,000
Grove Street South of Spring Street	325	0.09 *	4,000
Cameron Street South of Washington Street	165	0.09 **	2,000

PHV – Peak Hour Volume (bi-directional), as obtained by turning movement counts.

K Factor – Portion of Daily Traffic occurring in the Peak Hour.

ADT – Average Daily Traffic (bi-directional)

\* From Historical Data

\*\* MassDOT Average K Factor

The highest peak hour traffic volumes in the study area occur on Washington Street (Rte 16) between Cameron Street and Library Drive. In the morning (AM) peak hour, Washington Street carries approximately 1,975 two-way vehicles with 65% traveling eastbound and 35% traveling westbound. In the afternoon (PM) peak hour, Washington Street carries approximately 1,600 vehicles with 53% westbound and 47% eastbound. Based on historical K-Factors, Washington Street carries approximately 33,000 vehicles per day. Cameron Street carries between 100 and 200 vehicles in the AM and PM peak hours., representing approximately 2,000 vehicles per day. Grove Street was carries approximately 325 two-way vehicles in the PM peak hour, representing approximately 4,000 vehicles per day.

## 2.5 SCHOOL OPERATIONS AND OBSERVATIONS

BETA staff observed school operations on Tuesday, September 25, 2018 during the arrival (7:40 AM - 8:45 AM) and dismissal (2:30 PM - 3:35 PM) periods. The morning arrival and afternoon dismissal periods are discussed separately below. Hunnewell School operates between 8:30 AM and 3:05 PM Monday through Friday, except for Wednesdays where students are released at 12:00 PM (noon).

### 2.5.1 SCHOOL ARRIVAL PERIOD

- 7:45 AM: Teachers/staff already in parking lots.
- Some early arrival students before 8:00 AM via walking, and drop-off on Cameron Street and half-circle driveway.
- 8:00 AM: METCO school bus arrives and lets students out (12) on Cameron Street; bus departs after students alight.
- 8:05 AM: 2<sup>nd</sup> school bus arrives (5 students) and departs at 8:13 AM turning right onto Washington Street.
- 8:06 AM: School van arrives (5-7 students) and departs at 8:16 AM turning left onto Washington Street.
- 8:10 AM: Light rain begins. Two teachers assist drop-offs on Cameron Street, facility staff member prevents vehicles from entering half-circle driveway; four pedestrians arrive from north on Cameron Street.
- 8:15 AM: Garbage truck turns left from Washington Street to Cameron Street and then turns right onto Spring Street.
- 8:20 AM: Long northbound queues extend upstream on Cameron Street to the south; four-vehicle queue on Cameron Street to the north of the school, queue dissipates due to right-on-red maneuvers.
- 8:25 AM: Long northbound rolling queue on Cameron Street south of school that extends back to Hampden Street; Northbound five-vehicle queue on Cameron Street at Washington Street; garbage truck returns traveling northbound on Cameron Street and turning left onto Spring Street.
- 8:30 AM: Eight-vehicle queue on Spring Street at Grove Street; no queues on Cameron Street south of the school.

#### General Notes:

- No vehicles entered the school half-circle driveway. “Do Not Enter from 8AM to 9AM” signage is posted at the entrance to the half-circle driveway. All buses and vans stop along the east side of Cameron Street between the half-circle driveway entrance and exit.
- Parents and students walk to school on sidewalk on Cameron Street south. It is understood that some parents park on Brook Street and walk on the path to Cameron Street. There may have been fewer today due to rain.
- Students on buses walk on grass directly to the front door. There is a sidewalk that connects to the outside of the half circle in front of the school. On snow days, children without boots will use the sidewalk.

- It is noted that right turns on red exiting Cameron Street onto Washington Street cannot see to the left (west) primarily due to the building (550 Washington Street) on the southwest corner. A mailbox, sign pole and signal pole also partially restrict the motorist sight line. BETA measured the Intersection Sight Distance (ISD) from the Cameron Street Stop Bar looking left (west) on Washington Street. The ISD is approximately 75 feet from the Cameron Street Stop Bar to the eastbound outside travel lane on Washington Street approaching Cameron Street. Motorists must pull their vehicle forward beyond the Stop Bar into the Cameron Street crosswalk to see beyond the building and increase sight distance.
- Right turns from Washington Street to Cameron Street eastbound swing wide due to the tight corner and drive over the double yellow center line.
- Some parents utilized the Cameron Street and Library parking lots for student drop-off.
- One parent commented that the drop-off operation today was typical for a rainy day. On clear days, more parents walk with children, including those who park on Brook Street and use the path to walk to the school.
- Overall, the school arrival period operated efficiently with minimal conflicts and delays.



Sight Distance from Cameron Street Northbound Looking West onto Washington Street

#### 2.5.2 SCHOOL DISMISSAL PERIOD

- 2:30 PM: Heavy rain; a few parents start parking on Cameron Street; Cameron Street Parking Lot and Library Lot are more utilized than in the morning with parents parking in empty spaces in the lot; vehicles continue to pull up into the crosswalk on Cameron Street at Washington Street to see around the corner of the building on the northwest corner and make a right turn on red.
- 2:35 PM: Seven (7) vehicles parked on Cameron Street south of school.
- 2:40 PM: Twelve (12) vehicles parked on Cameron Street south; three parents observed parked in marked spaces in the school teacher/staff lot.
- 2:45 PM: Fifteen (15) vehicles parked on Cameron Street south with queue approaching Hampden Street; one (1) vehicle parked in Dana Hall driveway.
- 2:50 PM: Cameron Street south queue back to Hampden Street.
- 2:55 PM: Cameron Street south queue back to Hampden Street, two (2) vehicles parked in Dana Hall driveway; one (1) SUV parked within crosswalk at school half-circle driveway; 1st school bus arrives out front, leaves at 3:21 PM with 34 students; it turns left onto Spring Street then right onto Grove Street.
- Shortly before 3:00 PM many parents walk up to the school to wait for children.
- 3:02 PM: School van arrives and leaves at 3:13 PM with 5-7 students.
- 3:04 PM: First children exit building; 2<sup>nd</sup> school bus arrives and leaves with 12 students at 3:14 PM with turning left onto Spring Street and then left onto Grove Street.
- 3:07 PM: Six vehicle queue on Cameron Street at Washington Street; southern portion of Cameron Street Lot is mostly occupied with parents parking in marked spaces; adjacent private parking lot (for 40 Grove Street) is mostly full.

- 3:08 PM: Most children are outside the school.
- 3:10 PM: Parents and children start returning to vehicles.
- 3:14 PM: Drivers have difficulty exiting the Cameron Street Parking Lot due to poor sight lines from parked vehicles along the east side of Cameron Street. Most vehicles exiting the lot continue straight onto Spring Street; eight vehicle queue on Spring Street at Grove Street; queue starts to extend back to Cameron Street.
- 3:15 PM: Most children have left school; no vehicle queue on Cameron Street south of school; seven-to-ten (7-10) vehicle queue on Cameron Street north of school from Washington Street; queue blocks the Cameron Street Parking Lot driveway.
- 3:17 PM: Emergency pre-emption triggered twice at the Washington Street/Cameron Street signal; no emergency vehicle observed.
- 3:19 PM: Emergency pre-emption again; ambulance travels north on Grove Street and turns right onto Washington Street passing the site (this is the third trigger).
- 3:21 PM: One parent drove into the half-circle at 3:21 PM and parked in a marked space.
- 3:30 PM: No vehicles parked on Cameron Street north of school; off-street parking facilities are not empty; but school-related activity in the lots has ended.

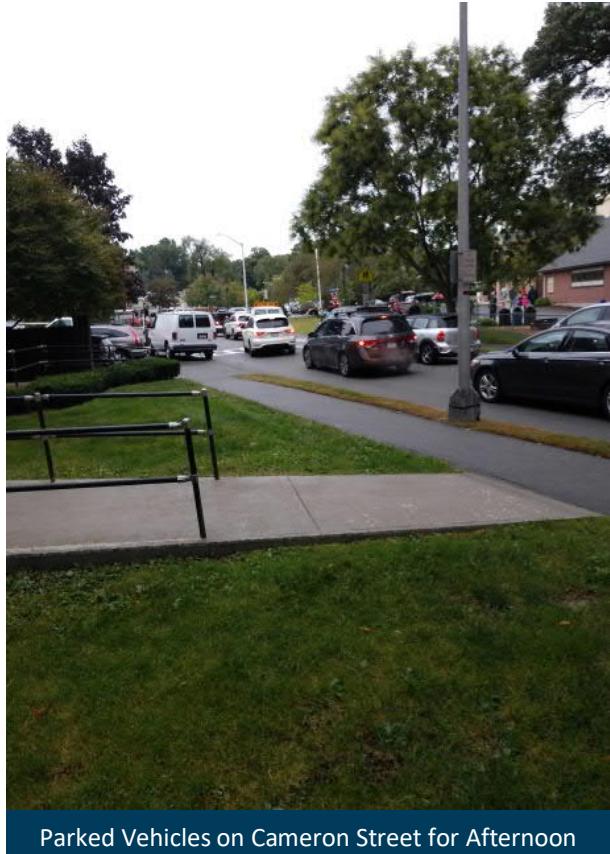
#### 2.5.3 GENERAL NOTES

- Parents can park temporarily in the Cameron Street Parking Lot during school arrival (8:00-8:45 AM) and dismissal (2:45-3:45 PM) periods. The school no longer issues permits to parents for parking. The school issues 15 permits to staff to park in the Camron Street Lot.
- Overall, the school dismissal period operated efficiently with minimal conflicts and delays. Some parents were observed parked illegally and in private lots.

#### 2.5.4 TRAVEL SPEEDS

There are static 20 MPH school zone type signs in both directions on Cameron Street approaching Hunnewell School. There is also a flashing 20 MPH school speed limit when flashing sign on northbound Cameron Street north of Brook Path. Near the Library driveway on Cameron Street there is a flashing beacon ("Do Not Enter When Lights Flashing") and sign to prevent southbound travel during school arrival and dismissal periods. The "Do Not Enter" hours are 8-9 AM Monday-Friday; 2:45-3:45 PM Monday-Tuesday and Thursday-Friday; and 11:30 AM-12:30 PM Wednesday.

BETA staff measured vehicle travel speeds in both directions on Cameron Street during school arrival and dismissal periods on Friday, February 14, 2020. Vehicle speeds were measured using a "floating vehicle" technique where the survey vehicle travels at the same speed as prevailing traffic. During school arrival and dismissal periods southbound travel on Cameron Street is only allowed between Washington Street and Spring Street. The prevailing vehicle speed was measured to be approximately 20 MPH in both directions on Cameron Street during school arrival and dismissal periods.





Parents waiting for school dismissal

## 2.6 PARKING CONDITIONS

BETA conducted a parking occupancy survey of off-street and on-street public parking spaces in the vicinity of Hunnewell School on Tuesday, September 25, 2018. The following off-street and on-street facilities were inventoried to identify the number of legal parking spaces:

1. Cameron Street Parking Lot (137 spaces)
  - a. 94 Spaces All Day Parking Monday-Friday (8 AM-6 PM)
  - b. 14 4-Hour Metered Spaces
  - c. 25 2-Hour Metered Spaces
  - d. 4 Handicap Spaces
2. Library Parking Lot (64 spaces)
3. Hunnewell Teacher/Staff Lot (28 spaces)
4. School Half-Circle Driveway (8 spaces)
5. Library/School Side (18 spaces)
6. Hunnewell Side Lot (5 spaces)
7. Library Garage (53 spaces after 9 AM)
8. Cameron Street (35 spaces)
9. Spring Street (6 spaces)

There are a total of 354 legal public parking spaces in the project study area (313 off-street, 41 on-street). The Library Garage does not open until 9:00 AM on weekdays, so the capacity before 9:00 AM is 301 spaces (354 total spaces minus 53 garage spaces). The Library Garage closes at 9:30 PM Monday-Thursday, at 6:30 PM on Friday, 5:30 PM on Saturday and is open between 1:00 and 5:00 PM on Sunday. The Cameron Street Parking Lot (137 spaces) is a pay facility and primarily serves commuters using the MBTA

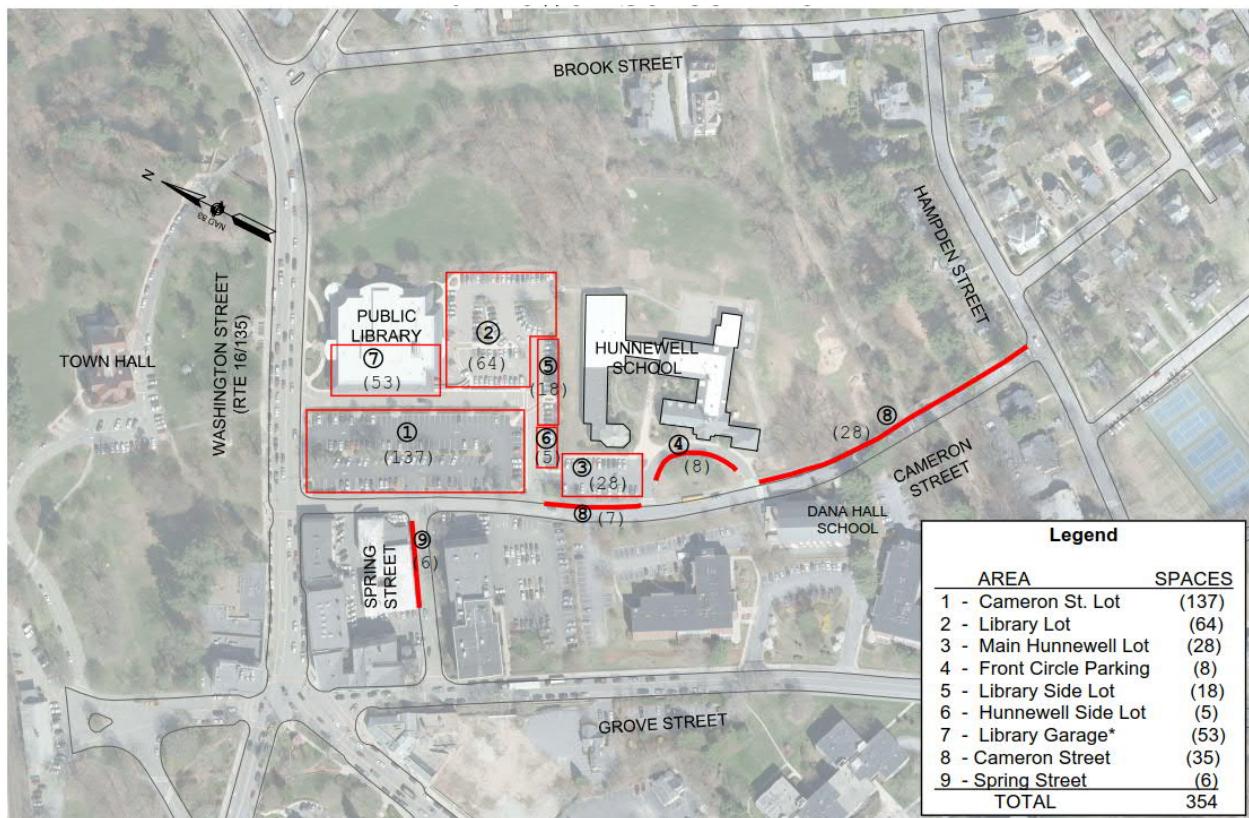
Wellesley Commuter Rail Station. The all-day spaces are pay by ticket (\$6.00 daily rate and \$3.00 for residents and businesses with stored value card). The two- and four-hour spaces are metered (\$0.05 for 5 minutes, \$0.10 for 10 minutes, and \$0.25 for 30 minutes).

Many parents park in the Cameron Street and Library lots during arrival and dismissal periods. The Town has historically issued permits to parents for short-term parking, but no longer does. Parents legally can park in these lots between 8:00 and 8:45 AM and 2:45 and 3:45 PM. If parents are inadvertently issued a parking ticket, the Town will waive the ticket.

The school received 20 permits from the Town for teachers to park in the Cameron Street Lot. Currently the school distributes permits to 15 teachers.

Cameron Street allows two-hour on-street parking on the east side both south of the school (28 spaces) and north of the school (7 spaces) during arrival and dismissal periods. **Figure 6** shows the location and parking capacity of the parking facilities surveyed for this study.

**Figure 6: Public Parking Spaces**  
Hunnewell School Area – after 9 AM



\* Available after 9:00 AM

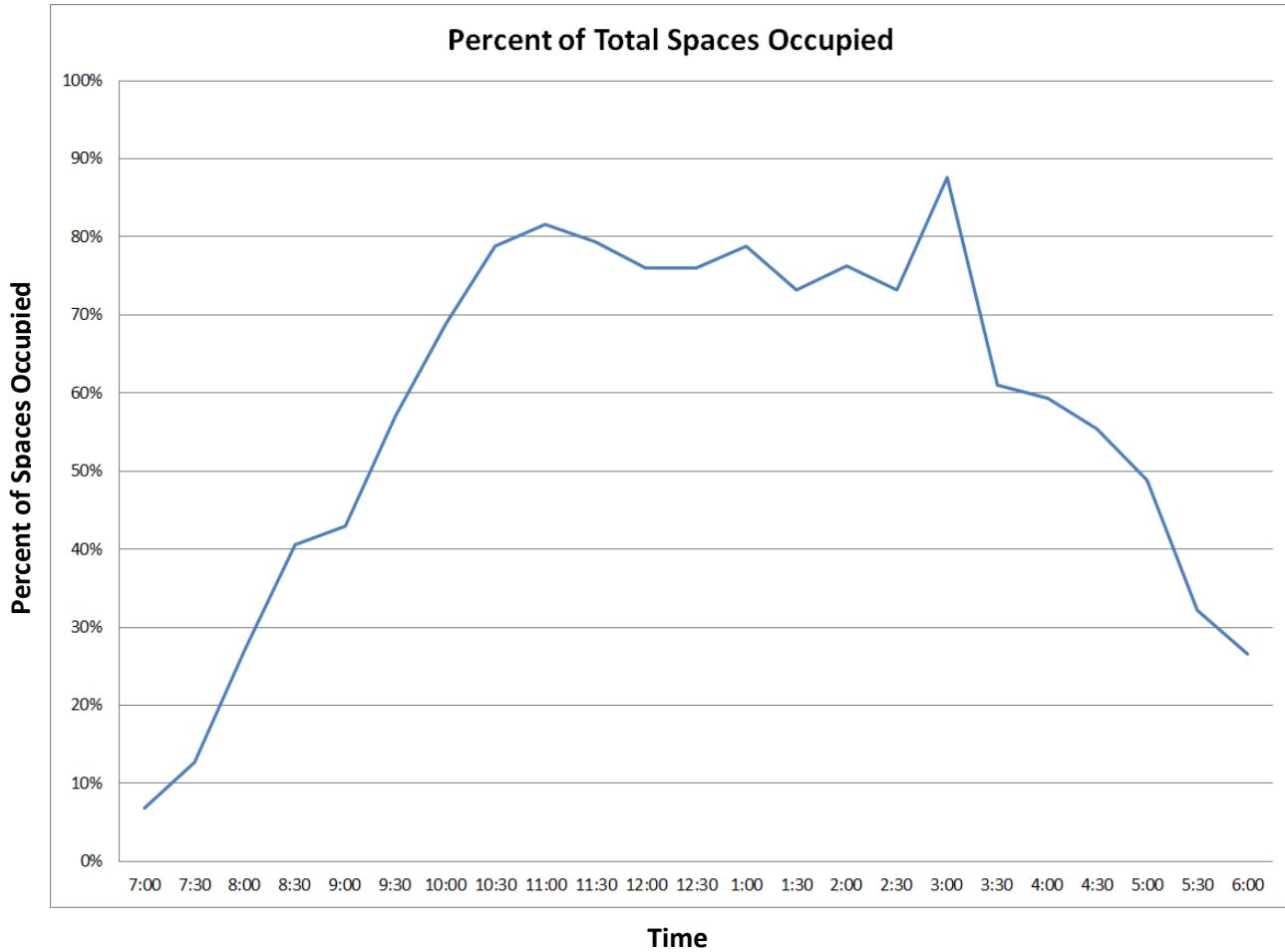
Parked vehicles were recorded every half hour between 7:00 AM and 6:00 PM at each of the study locations. Vehicles that were parked in illegal spaces were also recorded. **Table 4** and **Figure 7** summarize the parking survey results. A total of 7% of the total parking spaces were occupied at 7:00 AM. The parking occupancy increased steadily until 11:00 AM where 82% of the spaces were occupied. The Library was heavily utilized during this time period with both the Library Lot (109%) and Library Garage (104%) being over capacity. The overall parking occupancy was steady between 11:30 AM and 2:30 PM (73% to 79%).

**Table 4: Public Parking Survey Results**

**Hunnewell Elementary School  
September 25, 2018**

Time	Total Available Spaces	Total Parked Vehicles	% Occupied
7:00 AM	301	20	7%
7:30 AM	301	37	13%
8:00 AM	301	79	27%
8:30 AM	301	118	41%
9:00 AM	354	152	44%
9:30 AM	354	202	59%
10:00 AM	354	244	71%
10:30 AM	354	279	79%
11:00 AM	354	289	82%
11:30 AM	354	281	79%
12:00 PM	354	269	76%
12:30 PM	354	269	76%
1:00 PM	354	279	79%
1:30 PM	354	259	73%
2:00 PM	354	270	76%
2:30 PM	354	259	73%
3:00 PM	354	310	88%
3:30 PM	354	216	61%
4:00 PM	354	210	61%
4:30 PM	354	196	57%
5:00 PM	354	173	50%
5:30 PM	354	114	33%
6:00 PM	354	94	27%
<b>Average</b>	<b>345</b>	<b>201</b>	<b>57%</b>

**Figure 7: Public Parking Utilization**  
**Hunnewell Elementary School**  
**September 25, 2018**



The peak parking occupancy (between 7:00 AM and 6:00 PM) for the study area occurred at 3:00 PM with 88% of the spaces occupied. This peak parking demand is primarily the result of parents parking to pick up children at the 3:05 PM school dismissal time. The actual parking demand during the 3:00 PM period is higher if parent vehicles parked in other private spaces are included. At least 10 parent vehicles were observed parked in the private lots on the west side of Cameron Street. Two parent vehicles were parked illegally in the Dana Hall driveway across from the south school half-circle driveway on the west side of Cameron Street. Including these vehicles would increase the overall parking occupancy to approximately 90%, which can be considered to be near functional capacity. After 3:00 PM, the overall parking occupancy dropped steadily to 27% occupancy at 6:00 PM. The average overall parking occupancy for the entire survey period was 57%. The 313 public off-street parking spaces are between 76% and 90% occupied between 10:00 AM and 3:00 PM.

Parking on the east side Cameron Street in front of the school is only allowed during school arrival and dismissal periods. During the morning arrival period, most of the Cameron Street spaces are occupied (94%) briefly. Most parents stop briefly and let their children out of the vehicle. This creates a rolling queue type traffic operation on Cameron Street northbound. Some parents do park and escort their children to the school. During the afternoon dismissal period, most parents park and walk to the school

to meet their children. Due to illegal parking, parking demand on Cameron Street is over capacity (109%) briefly during the dismissal periods. Parking demand on Cameron Street is minimal at all other times.

BETA also observed parking conditions in the study area on Saturday, October 20, 2018 at Noon. Approximately one-half of the study area spaces were occupied with very low utilization in the Library Garage and the all-day spaces in the Cameron Street Parking Lot.

The following is a summary of parking utilization at individual facilities in the study area:

1. **Cameron Street Parking Lot:** Between 10:00 AM and 3:00 PM the lot is generally 70% to 80% occupied, peaking at 85% at 3:00 PM.
2. **Library Lot:** Between 9:30 AM and 3:00 PM the lot is generally 85% to 100+% occupied, peaking at 109% at 11:00 AM.
3. **Main Hunnewell Lot:** Between 8:30 AM and 3:00 PM the lot is generally between 80% and 90% occupied, peaking at 93% at 3:00 PM.
4. **Half-Circle Parking:** These undesignated spaces are 100% occupied between 8:00 AM and 12:30 PM.
5. **Library Side Lot:** These spaces are generally 100% occupied between 10:00 AM and 2:00 PM.
6. **Hunnewell Side Lot:** These spaces are 80% occupied between 8:00 AM and 1:00 PM.
7. **Library Garage:** Between 10:00 AM and 5:00 PM the garage is generally 80% to 100% occupied, peaking at 104% at 11:00 AM.
8. **Cameron Street:** At 94% occupancy during morning arrival and 109% occupancy during afternoon dismissal. Minimal occupancy at all other times.
9. **Spring Street:** Between 4 and 7 vehicles parked most of the day, likely associated with businesses on Spring Street.

Vehicle parking occupancy by time of day for each facility is provided in the Appendix.

## 2.7 SAFETY ANALYSIS

The most recent three years (2015-2017) of available crash data were from the MassDOT Crash Database for all eight study area intersections. The database lists crash information for incidents reported to the Registry of Motor Vehicles. These generally come from State and Local police crash reports. As such, smaller fender bender type crashes that are not reported will not be included in this summary. A brief summary of the data is provided in **Table 5**.

The two large traffic signals of Washington Street and Central Street at Grove Street, and Washington Street at Wellesley Avenue and Brook Road were both found to have around 21 crashes in three years. Sideswipes were more prevalent at the Washington Street and Grove Street intersection, likely due to the wide-open configuration. Washington Street at Wellesley Avenue had more angle crashes, consistent with typical traffic signal intersections. The intersection of Washington Street at Cameron Street, also a traffic signal, had 15 crashes in three years, consisting mostly of angles and sideswipes. All other unsignalized intersections in the study area had four or fewer crashes in three years. There were no reported pedestrian and bicycle crashes in the study area. There were no fatalities, and nearly all crashes resulted in property damage only. This is likely due to the slower speeds in the study area.

Table 5: Crash Data Summary

	Washington at Grove and Central	Washington at Cameron	Washington at Library	Grove at Spring	Grove at Hampden	Hampden at Cameron	Brook at Hampden	Washington at Wellesley and Brook
<b>Crash Type</b>								
Angle	4	7	2	1	1	0	1	10
Rear End	6	2	0	1	0	0	2	9
Sideswipe	11	5	0	2	0	0	0	3
Pedestrian/Bicycle	0	0	0	0	0	0	0	0
Single Vehicle	0	1	0	0	0	0	0	0
Not Reported	0	0	0	0	0	0	0	0
<b>Crash Severity</b>								
Property Damage	21	14	1	4	1	0	3	20
Non-fatal Injury	0	1	1	0	0	0	0	2
Not reported	0	0	0	0	0	0	0	0
<b>Crash Date</b>								
2015	9	7	1	1	1	0	2	9
2016	6	0	0	3	0	0	1	9
2017	6	8	1	0	0	0	0	4
<b>Summary</b>								
<b>Total Crashes 2015-2017</b>	<b>21</b>	<b>15</b>	<b>2</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>22</b>
<b>Crash Rate</b>	<b>0.60</b>	<b>0.63</b>	<b>0.08</b>	<b>0.81</b>	<b>0.12</b>	<b>0.00</b>	<b>0.48</b>	<b>0.85</b>
<i>Statewide Average</i>	0.78	0.78	0.57	0.57	0.57	0.57	0.57	0.78
<i>District 4 Average</i>	0.71	0.71	0.52	0.52	0.52	0.52	0.52	0.71

Crash rates were calculated based on MassDOT methodology. The crash rate compares average number of crashes per year at an intersection per one million entering vehicles (MEV). MassDOT maintains statewide and District average crash rate values for signalized and unsignalized intersections. Unsignalized intersections typically have lower average crash rates due to the lower entering volume and lower crash activity. These are listed in the bottom portion of the Table along with the calculated intersection crash rate. Values shown in red are above the MassDOT statewide and District 4 averages. It was found that the unsignalized intersection of Grove Street at Spring Street, and the signalized intersection of Washington Street at Wellesley Avenue and Brook Road are both over higher than the MassDOT averages. While the Grove Street intersection has a higher crash rate, only four crashes were reported all with only property damage. The high crash rate is likely due to the lower entering volume at this location.

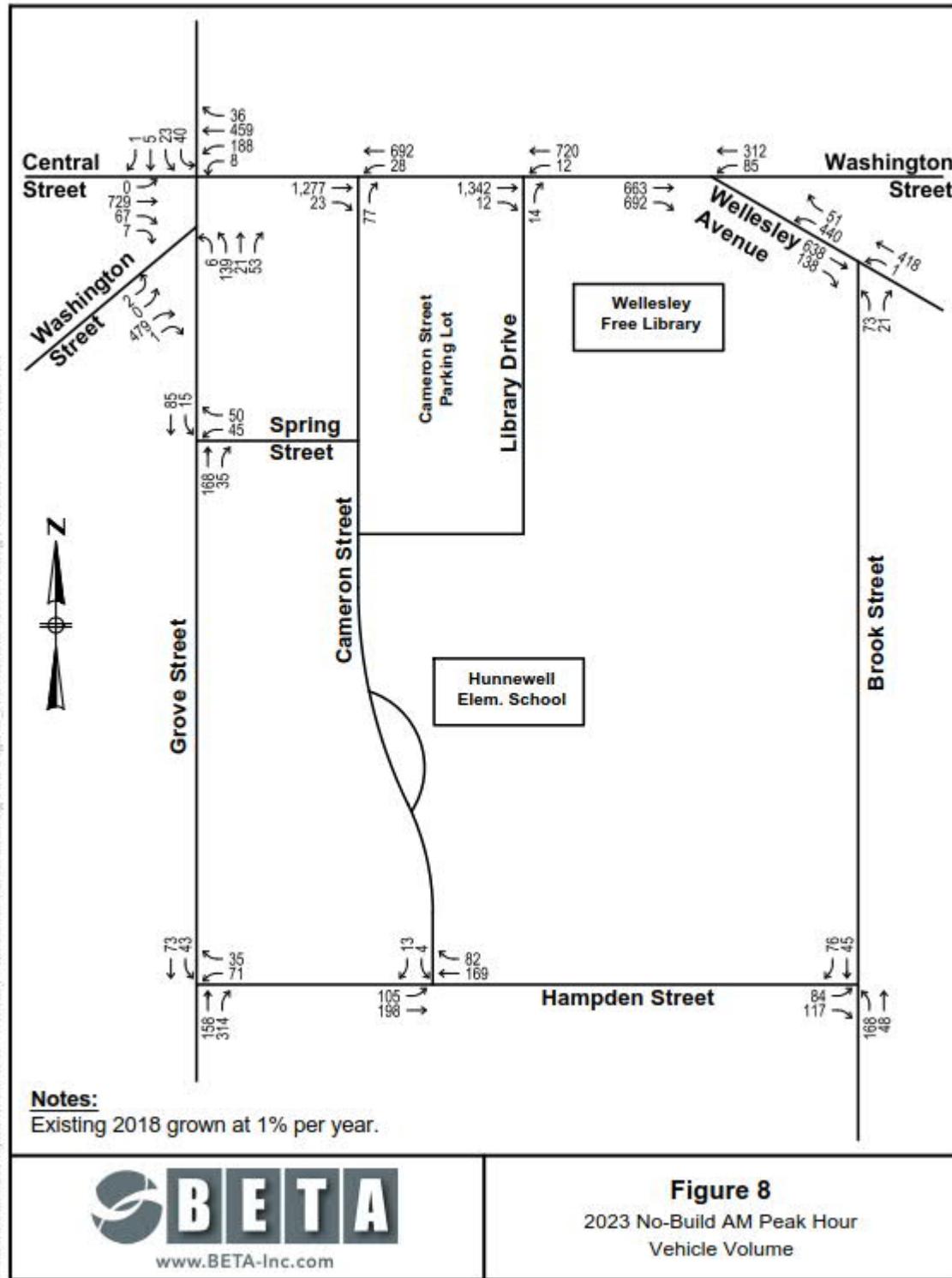
## 3.0 FUTURE CONDITIONS

Future study area operations (No-Build and Build) were evaluated for design years 2023 and 2026. The No-Build scenario assumes Hunnewell School continues to operate as it does today; which provides a baseline condition for which to compare the potential impacts of the construction project. The Build scenarios examine the construction of a new Hunnewell School on the existing site. These also assume full enrollment of the new school including changes to elementary school districts throughout the Town of Wellesley.

### 3.1 No-BUILD CONDITIONS

Future No-Build traffic volume projections typically consist of a general background growth factor and traffic generated from other known specific projects within the area. Discussion with the Town revealed no other specific projects that should be accounted for as part of this evaluation. For the purposes of this study a 1.0% per year background traffic growth rate was applied to the Existing volumes to obtain the Design Year 2023 and 2026 No-Build traffic volumes. **Figure 8 through Figure 11** graphically show the 2023 and 2026 AM and PM Peak Hour No-Build volumes.

Figure 8: 2023 No-Build AM Peak Hour Traffic Volumes



**Figure 8**  
2023 No-Build AM Peak Hour  
Vehicle Volume

Figure 9: 2023 No-Build PM Peak Hour Traffic Volumes

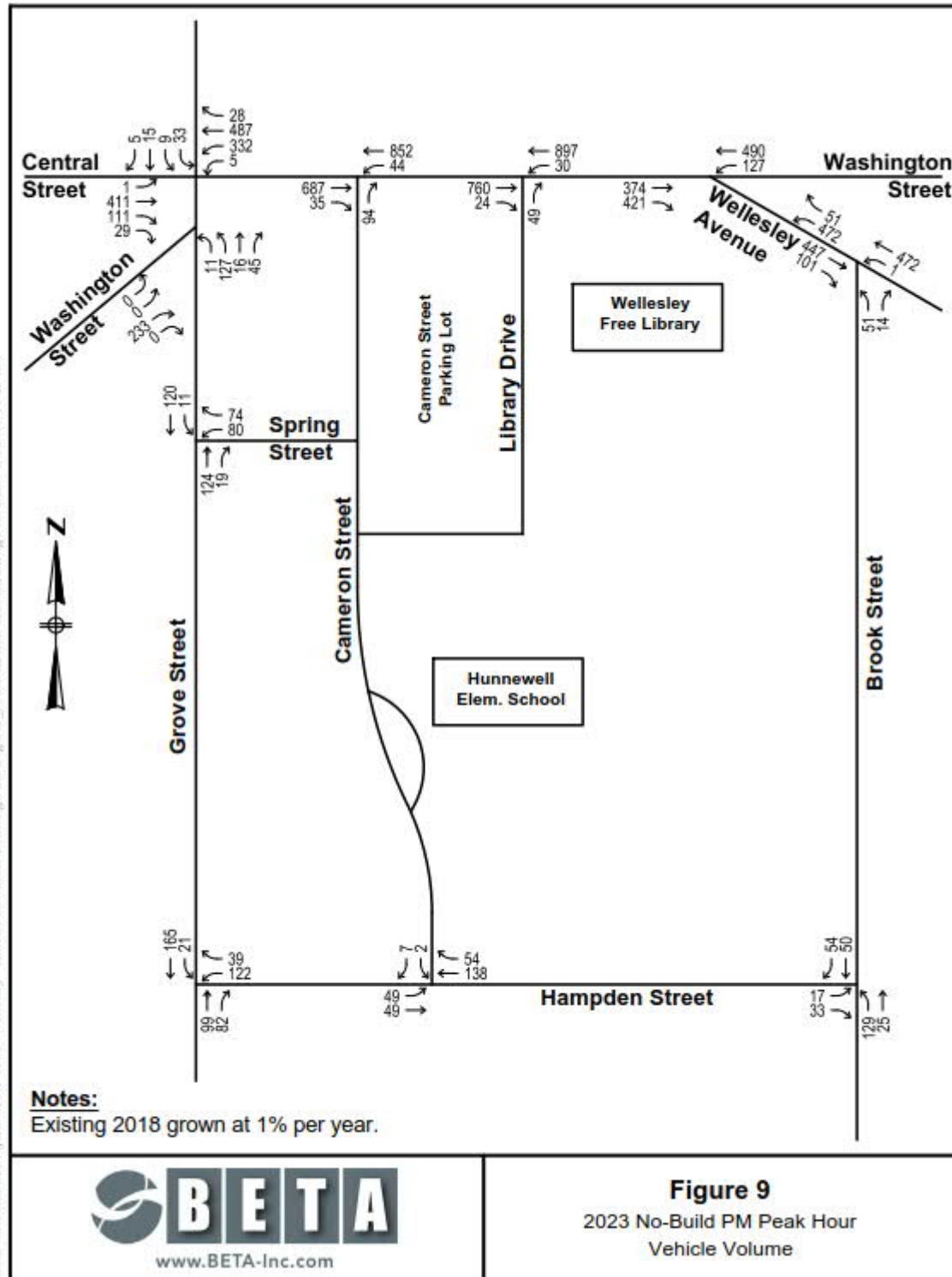
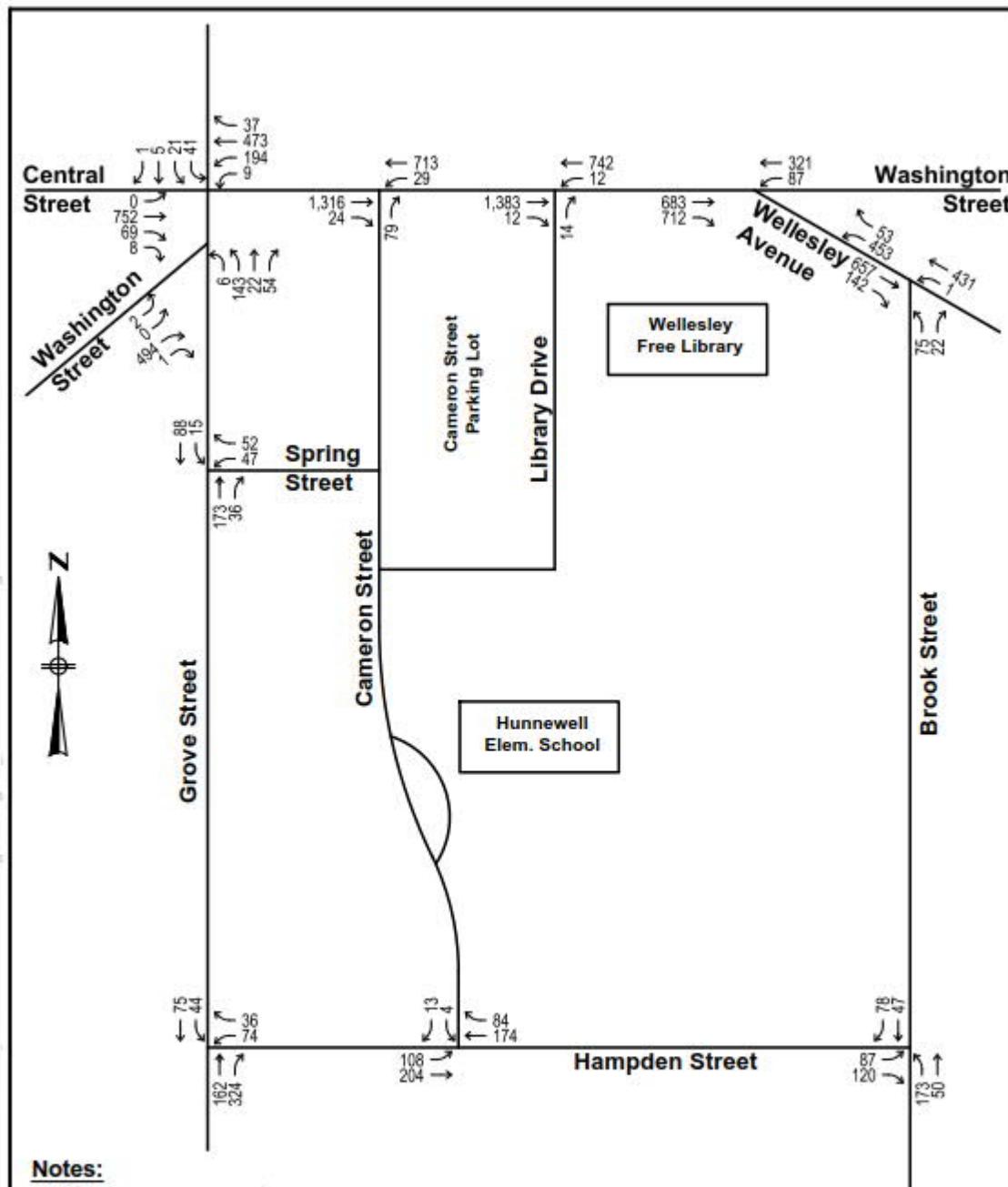


Figure 10: 2026 No-Build AM Peak Hour Traffic Volumes



**Figure 10**  
2026 No-Build AM Peak Hour  
Vehicle Volume



Figure 11: 2026 No-Build PM Peak Hour Traffic Volumes

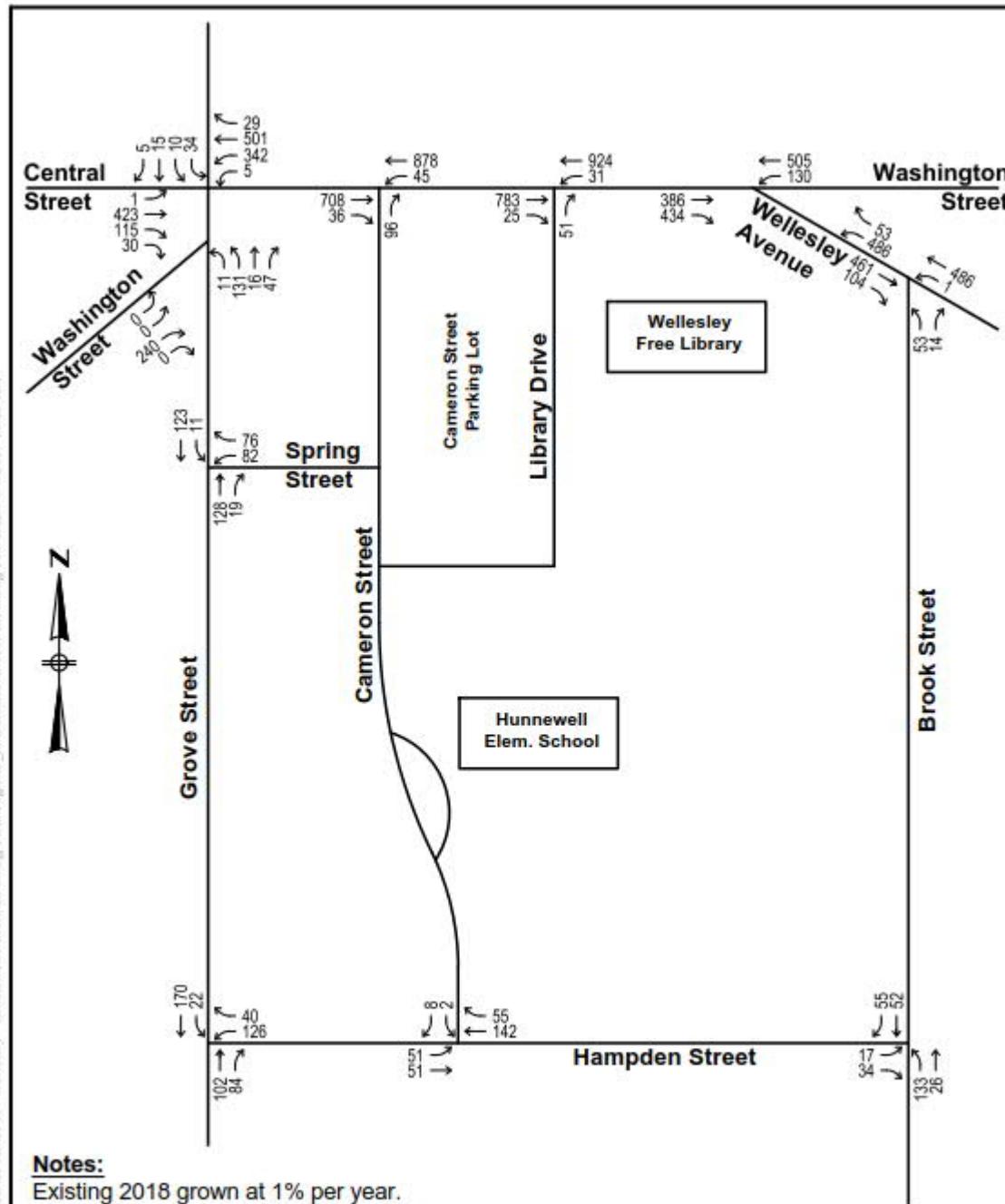


Figure 11  
2026 No-Build PM Peak Hour  
Vehicle Volume

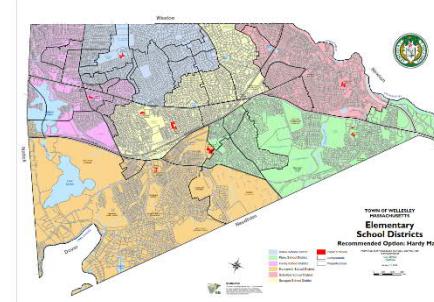


### 3.2 BUILD CONDITIONS

The Build conditions represent the construction and full enrollment of the new Hunnewell School including changes to the elementary school districts. To evaluate these conditions, additional traffic volume from the school was distributed onto the study area roadway network. These trips were added to the No-Build traffic volumes to create the 2023 and 2026 Build traffic volumes for the AM and PM peak hours.

#### 3.2.1 GENERATED TRAFFIC

Project generated vehicle trips were based on the number of redistricted student households assigned to the Hunnewell School. Redistricted households were estimated using GIS mapping, provided by the Town, which displayed the number of households and students within the existing and proposed school districts. Comparing the two maps revealed an approximate ratio of 1.38 students per household within the redistricting area for Hunnewell School. This ratio was applied to the projected student population ( $\pm 365$ ) to obtain the estimated number of new households in the district ( $\pm 79$ ). *It is important to note that this exercise assumed an existing student population of 256 students, which is less than the previously reported 264 students discussed in the Existing Conditions section of this study. The discrepancy in volumes is due to updated data provided by the Town received at the end of the school year versus the beginning of the year. If anything, this discrepancy represents a conservative analysis.*



This study assumed that one household generally represents one trip to and from the school. While it is expected that some trips to and from the school may be part of a multi-destination trip such as to work; this study assumes all trips originate at home, travel to the school, and travel back home. While the traffic volumes suggest traffic patterns are different in the AM and PM peak hours, this study assumes the same trip generation and distribution for the drop-off and pick-up periods.

The redistricted household trips were assigned to the study area proportionally based on the existing households within the redistricting area shown in the Town's GIS maps. A graphic summary of all redistricted (new) household trips is shown in **Figure 12**.

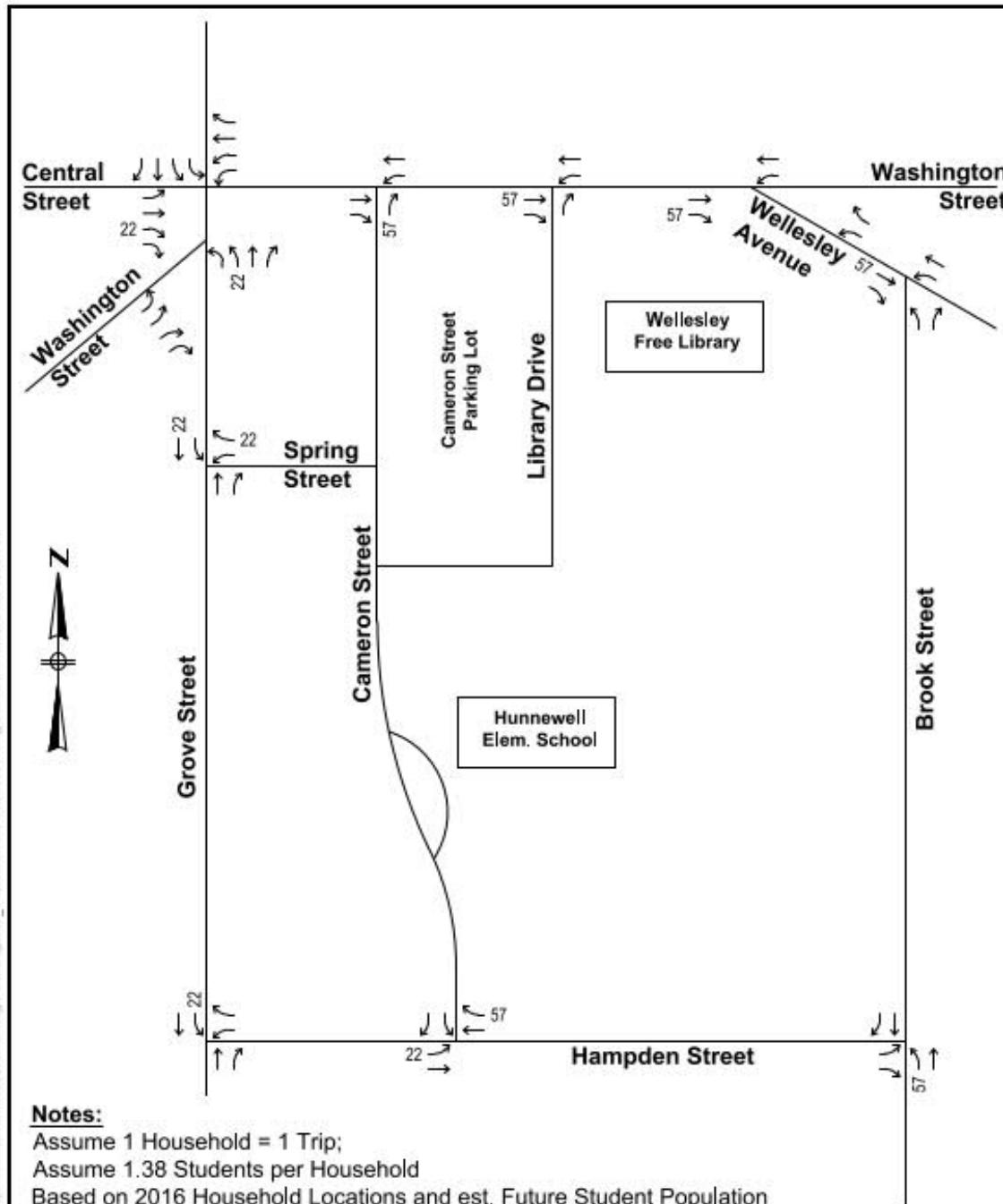
#### 3.2.2 MODE SPLIT

For the purposes of this study, based on discussions with the Town, it was expected that 85% of students would travel to and from the school via private auto and 15% by school bus. While Hunnewell School is known to be one of the most walkable elementary schools, this evaluation assumes no credit for walking trips. This mode split is conservative based on the 2016 mode split survey for Hunnewell School (7-13% by bus, 23-33% Walk and 60-64% by auto).

Accounting for bus trips, the redistricted household trips were reduced by 15%. The resulting peak hour household auto trips (without buses) are shown in **Figure 13**.

The assigned redistricted household auto trips were added to the No-Build traffic volumes to create the 2023 and 2026 Build traffic volumes, shown in **Figure 14** through **Figure 17**.

**Figure 12: School Redistricting Trips (Households)**  
**AM and PM Peak Hours**



**Figure 12**  
School Redistricting Trips  
(Households)

**Figure 13: School Redistricting Trips (Households without Buses)**  
**AM and PM Peak Hours**

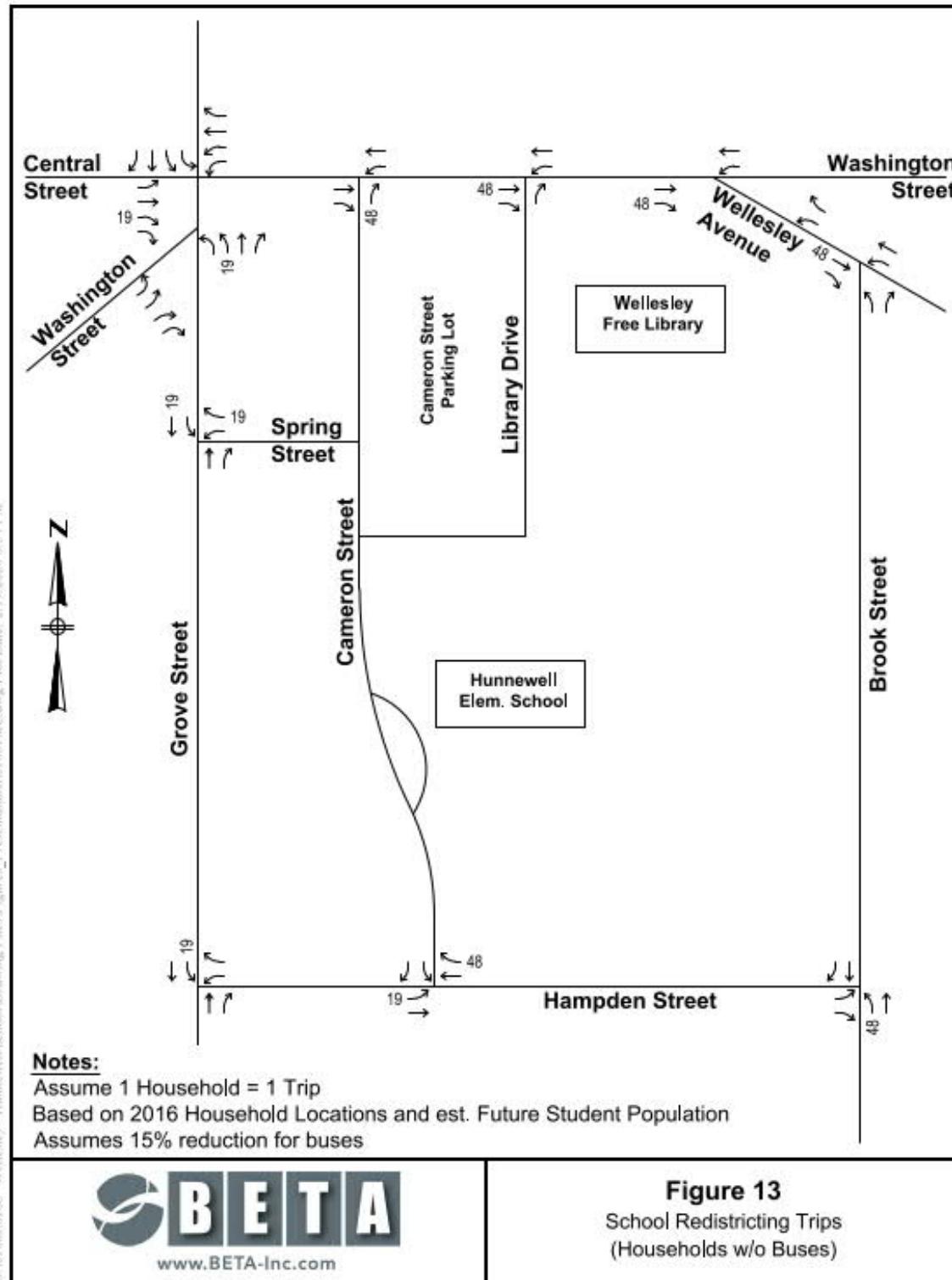
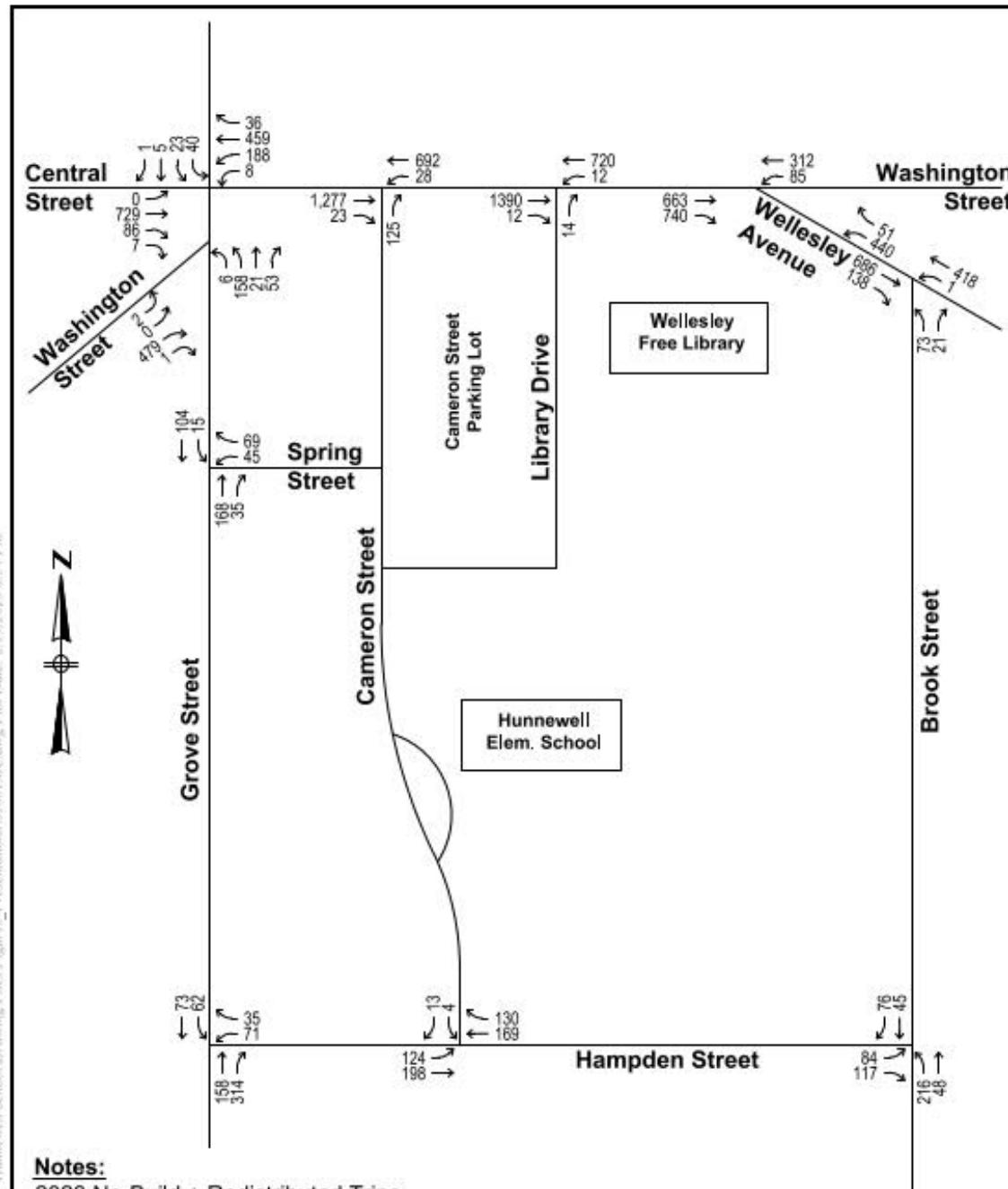
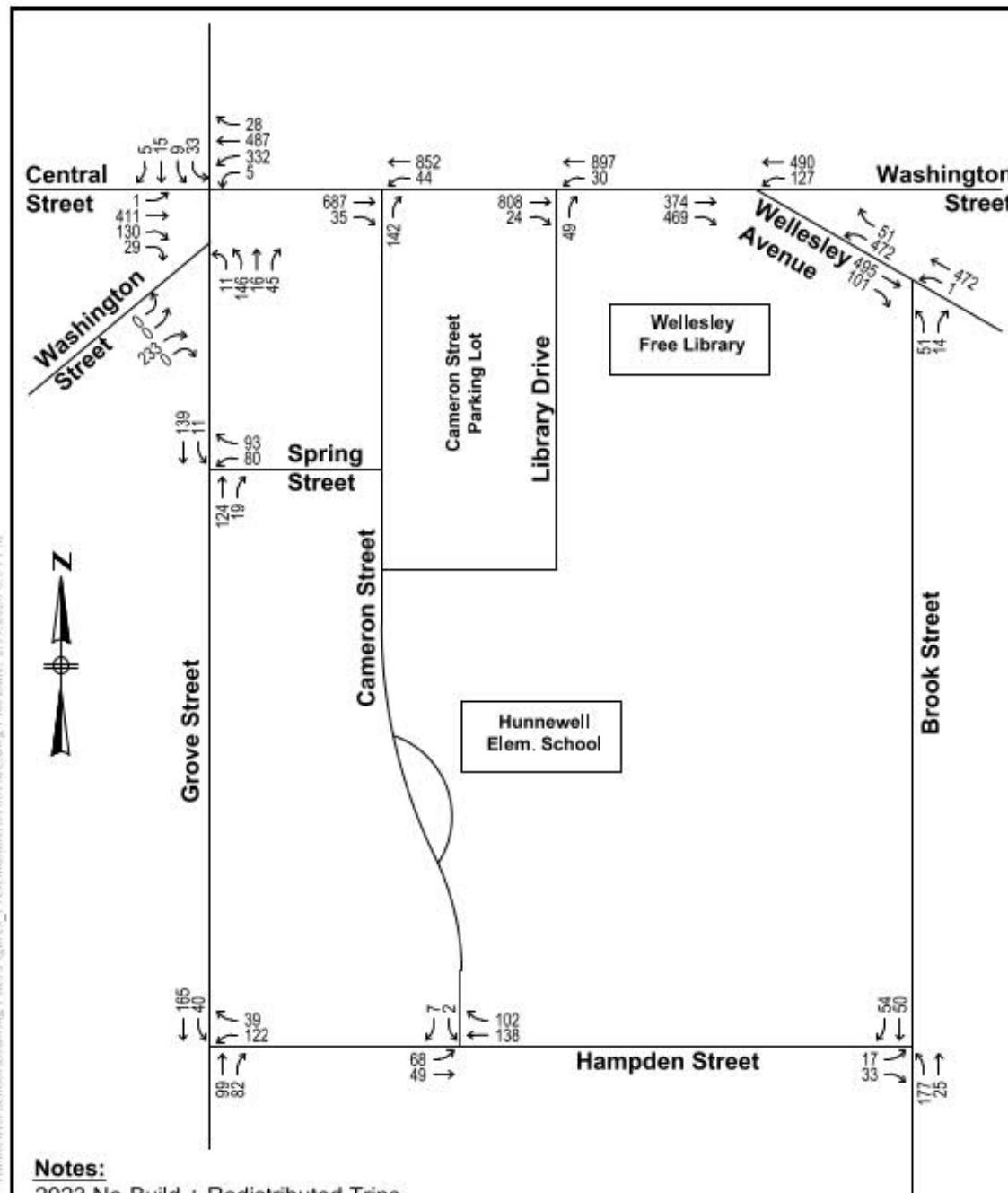


Figure 14: 2023 Build AM Peak Hour Traffic Volumes



**Figure 14**  
2023 Build AM Peak Hour  
Vehicle Volume

Figure 15: 2023 Build PM Peak Hour Traffic Volumes



**Figure 15**  
2023 Build PM Peak Hour  
Vehicle Volume



Figure 16: 2026 Build AM Peak Hour Traffic Volumes

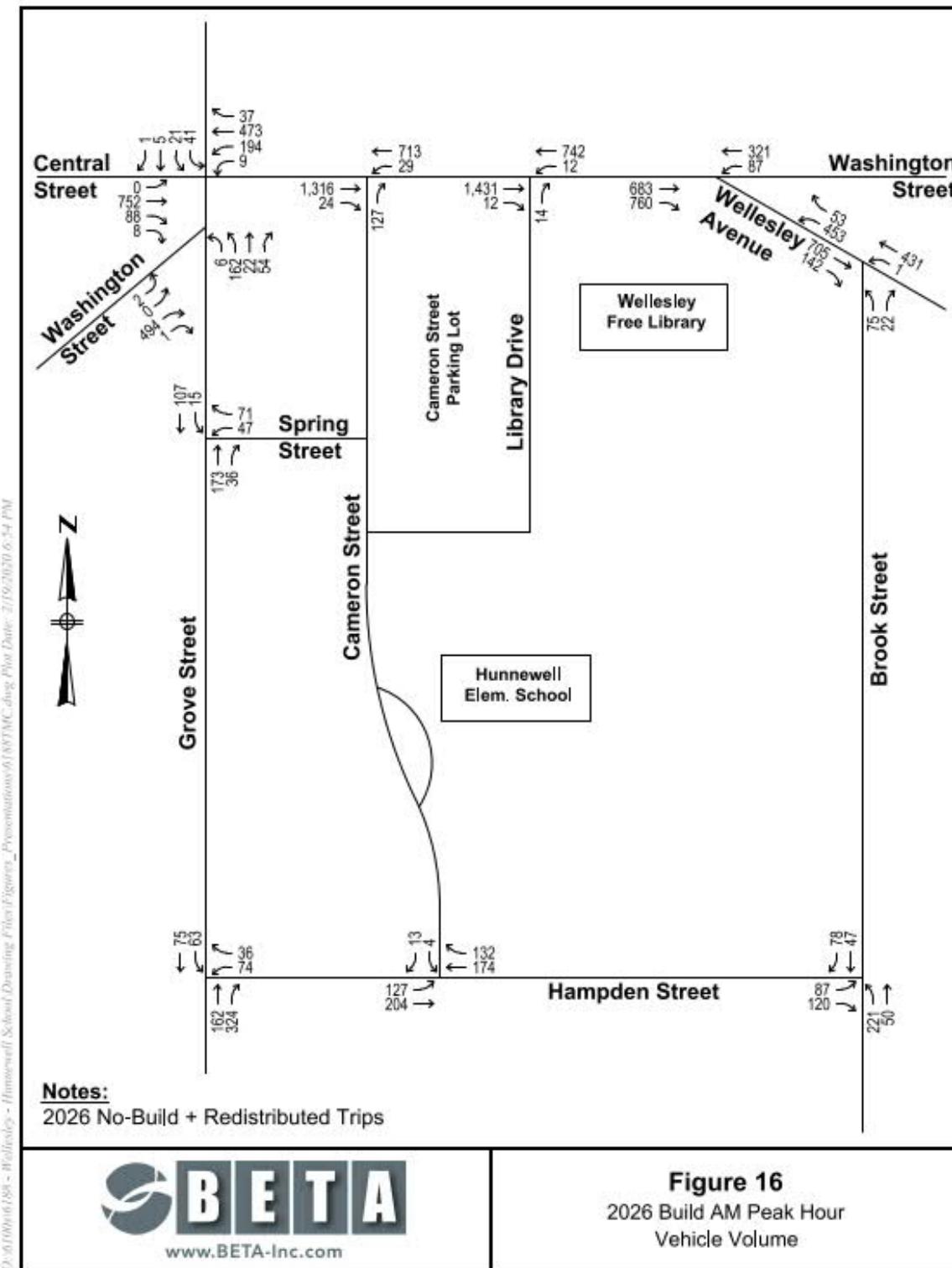
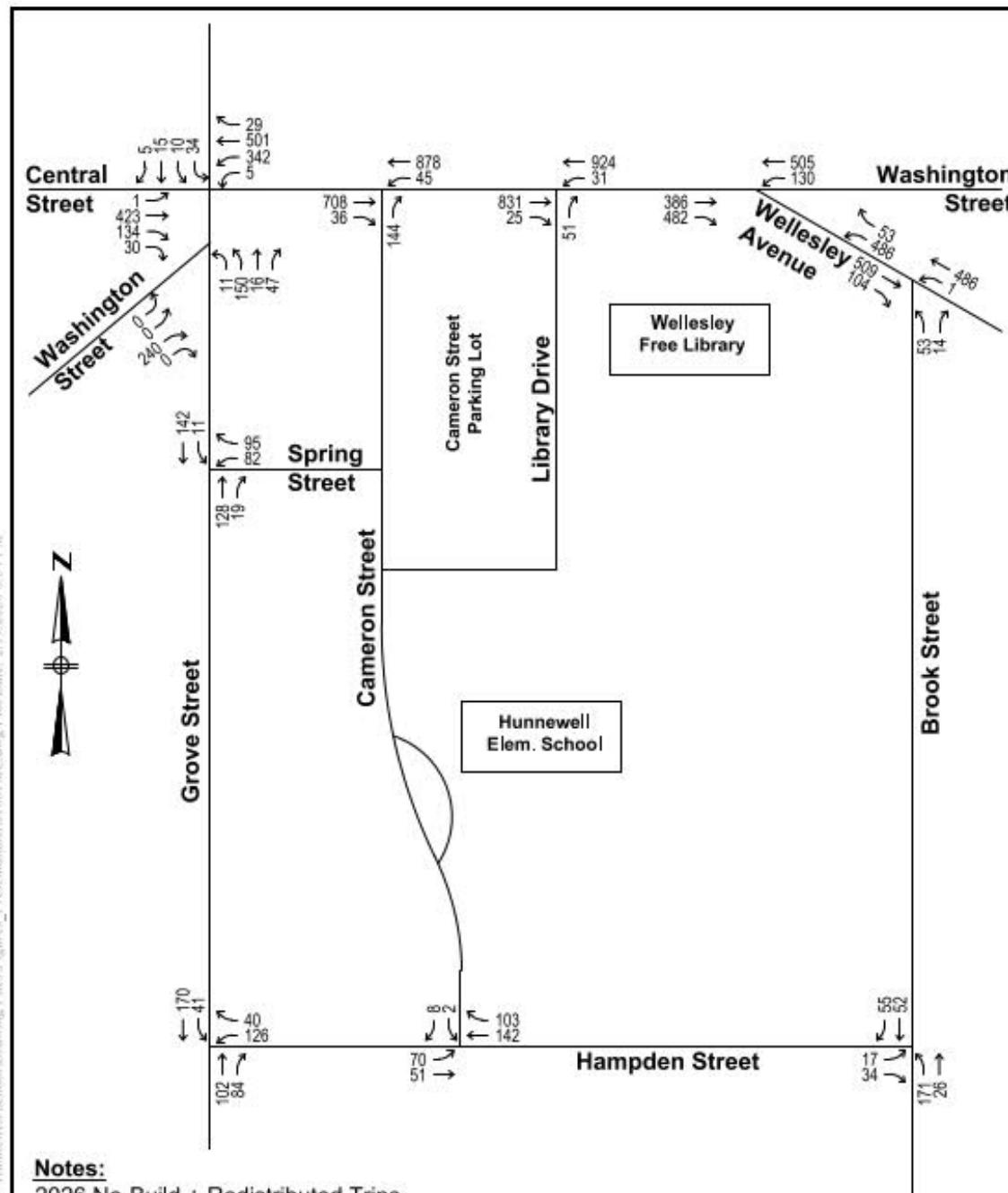


Figure 17: 2026 Build PM Peak Hour Traffic Volumes



**Figure 17**  
2026 Build PM Peak Hour  
Vehicle Volume



## 4.0 TRAFFIC OPERATIONS ANALYSIS

### 4.1 TRAFFIC CAPACITY ANALYSIS METHODOLOGY

Capacity analyses were conducted to assess the quality of traffic flow at each of the study intersections. This was performed for existing and future conditions for the weekday AM and PM peak hours.

Capacity analysis was performed for study intersections using Trafficware's Synchro software package (Version 9.0). The Synchro Software analysis utilizes methods of the 2010 *Highway Capacity Manual (HCM 2010)* published by the Transportation Research Board.

For intersections, six levels of service (LOS), "A"-“F”, have been established with "A" representing very good operation and "F" representing very poor operation. For signalized and unsignalized intersections, level of service is defined in terms of total delay and is computed for individual intersection turning movements. Delay is a measure of driver discomfort, frustration, fuel consumption, and lost travel time. The relationship between LOS and delay for unsignalized intersections and roundabouts are summarized in **Table 6**.

**Table 6: Level of Service Criteria**

LOS	Unsignalized Intersection Criteria Average Total Delay (Seconds per Vehicle)	Signalized Intersection Criteria Average Total Delay (Seconds per Vehicle)	General Description
A	< 10.0	< 10.0	Free Flow
B	10.1 to 15.0	10.1 to 20.0	Stable flow (slight delays)
C	15.1 to 25.0	20.1 to 35.0	Stable flow (acceptable delays)
D	25.1 to 35.0	35.1 to 55.0	Approaching unstable flow (tolerable delay)
E	35.1 to 50.0	55.1 to 80.0	Unstable flow (intolerable delay)
F	> 50.0	> 80.0	Forced flow (jammed)

In addition to delay and level of service, the analysis examined the volume to capacity ratio (v/c) and 95<sup>th</sup> percentile queues for each lane group. Movements that experience a v/c ratio greater than 1.0 operate over capacity and therefore receive a LOS F ranking regardless of the calculated average delay. The 95<sup>th</sup> percentile queue represents the length of vehicle queuing (in feet) that is only exceeded five percent of the evaluated peak hour. Capacity analysis worksheets are provided in the **Appendix**.

### 4.2 TRAFFIC CAPACITY ANALYSIS RESULTS

Intersection capacity and Level of Service (LOS) analysis was conducted for the Existing, No-Build and Build conditions for the AM and School PM peak hours. Summaries of the AM Peak Hour and PM Peak Hour capacity analysis results are displayed in **Table 7** through **Table 10**. Movements that were found to operate with level of service (LOS) F, delays with greater than 300 seconds (5 minutes) of delay, and/or volume to capacity ratios larger than 1.0 are highlighted in **red text**.

Table 7: AM Peak Hour Capacity Analysis Results (Existing and Future 2023)

INTERSECTION	Existing Conditions				2023 No-Build Conditions				2023 Build Conditions			
	LOS	Delay (s/veh)	v/c	95th % Queue	LOS	Delay (s/veh)	v/c	95th % Queue	LOS	Delay (s/veh)	v/c	95th % Queue
<b>Library Lot at Washington Street (Unsignalized)</b>												
Washington Street WB L	A	0.9	0.02	2	A	0.3	0.03	2	A	1.0	0.03	2
Library Lot NB R	A	0.0	0.00	0	B	10.3	0.04	3	B	10.3	0.04	3
<b>Grove Street at Spring Street (Unsignalized)</b>												
Spring Street WB LR	B	12.2	0.24	23	B	12.5	0.26	26	B	13.0	0.31	33
Grove Street SB LT	A	1.3	0.02	1	A	1.3	0.02	1	A	1.1	0.02	1
<b>Grove Street at Hampden Street (Unsignalized)</b>												
Hampden Street WB LR	B	14.0	0.26	26	B	14.6	0.28	29	C	15.4	0.30	31
Grove Street SB LT	A	3.5	0.04	3	A	3.6	0.05	4	A	4.4	0.07	5
<b>Hampden Street at Cameron Street (Unsignalized)</b>												
Hampden Street EB LT	A	3.9	0.13	12	A	4.0	0.14	13	A	4.7	0.18	16
Cameron Street SB LR	B	12.8	0.08	6	B	13.1	0.09	7	B	14.1	0.10	8
<b>Brook Street at Hampden Street (Unsignalized)</b>												
Hampden Street EB LR	B	14.9	0.39	47	C	15.8	0.43	53	C	19.0	0.49	67
Brook Street NB LT	A	6.5	0.15	13	A	6.6	0.16	14	A	7.1	0.20	19
<b>Washington Street at Grove Street and Central Street (Signalized)</b>												
Central Street EB LT/ TR	D	52.7	0.9	558	E	59.5	0.95	601	E	65.5	0.98	625
Washington Street WB L	F	>300	>1.0	510	F	>300	>1.0	532	F	>300	>1.0	532
Washington Street WB TR	B	11.6	0.51	428	B	12.0	0.54	460	B	12.0	0.54	460
Grove Street NB LTR	F	103.6	0.99	403	F	121.1	>1.0	428	F	152.2	>1.0	475
Grove Street SB LTR	D	42.7	0.35	105	D	42.9	0.36	109	D	42.8	0.36	109
Washington Street NEB BR/R	D	45.5	0.71	290	D	47.3	0.75	328	D	47.3	0.75	328
<b>Overall</b>	<b>F</b>	<b>159.8</b>	<b>&gt;1.0</b>	-	<b>F</b>	<b>170.3</b>	<b>&gt;1.0</b>	-	<b>F</b>	<b>174.4</b>	<b>&gt;1.0</b>	-
<b>Wellesley Avenue at Washington Street (Signalized)</b>												
Washington Street EB T	C	34.6	0.91	643	D	43.0	0.96	688	D	43.0	0.96	688
Washington Street EB R	A	2.1	0.46	26	A	2.2	0.49	26	A	2.3	0.52	27
Washington Street WB LT/ T	B	15.9	0.52	152	F	16.7	>1.0	165	F	16.7	>1.0	165
Wellesley Avenue NB LR	D	36.2	0.88	503	D	42.4	0.93	538	D	42.4	0.93	538
<b>Overall</b>	<b>C</b>	<b>21.8</b>	<b>0.91</b>	-	<b>C</b>	<b>25.8</b>	<b>0.96</b>	-	<b>C</b>	<b>25.4</b>	<b>0.96</b>	-
<b>Cameron Street at Washington Street (Signalized)</b>												
Washington Street EB T/ TR	A	8.7	0.74	210	A	9.5	0.77	292	A	9.4	0.77	251
Washington Street WB T/ LT	A	3.1	0.31	134	A	3.2	0.33	143	A	3.2	0.33	143
Cameron Street NB R	D	39.8	0.09	0	D	39.8	0.00	0	D	40.5	0.16	0
<b>Overall</b>	<b>A</b>	<b>8.8</b>	<b>0.60</b>	-	<b>A</b>	<b>9.3</b>	<b>0.63</b>	-	<b>B</b>	<b>10.5</b>	<b>0.63</b>	-

Table 8: PM Peak Hour Capacity Analysis Results (Existing and Future 2023)

INTERSECTION	Existing Conditions				2023 No-Build Conditions				2023 Build Conditions			
	LOS	Delay (s/veh)	v/c	95th % Queue	LOS	Delay (s/veh)	v/c	95th % Queue	LOS	Delay (s/veh)	v/c	95th % Queue
<b>Library Lot at Washington Street (Unsignalized)</b>												
Washington Street WB L	A	1.3	0.04	3	A	1.3	0.04	3	A	1.3	0.04	3
Library Lot NB R	B	10.9	0.10	8	B	10.1	0.09	7	B	10.4	0.09	7
<b>Grove Street at Spring Street (Unsignalized)</b>												
Spring Street WB LR	B	12.0	0.30	32	B	12.3	0.33	36	B	12.8	0.37	42
Grove Street SB LT	A	0.7	0.10	1	A	0.7	0.01	1	A	0.7	0.01	1
<b>Grove Street at Hampden Street (Unsignalized)</b>												
Hampden Street WB LR	B	13.2	0.32	34	B	13.8	0.34	38	B	14.8	0.37	42
Grove Street SB LT	A	1.0	0.02	1	A	1.0	0.02	2	A	1.8	0.04	3
<b>Hampden Street at Cameron Street (Unsignalized)</b>												
Hampden Street EB LT	A	4.1	0.05	4	A	4.1	0.05	4	A	5.0	0.08	6
Cameron Street SB LR	A	10.0	0.02	2	B	10.0	0.02	2	B	10.4	0.02	2
<b>Brook Street at Hampden Street (Unsignalized)</b>												
Hampden Street EB LR	B	10.0	0.09	7	B	10.2	0.09	8	B	10.7	0.10	9
Brook Street NB LT	A	6.5	0.09	8	A	6.6	0.1	8	A	7.0	0.13	12
<b>Washington Street at Grove Street and Central Street (Signalized)</b>												
Central Street EB LT/ TR	D	35.8	0.74	302	D	36.6	0.77	326	D	37.5	0.79	347
Washington Street WB L	F	>300	>1.0	686	F	>300	>1.0	716	F	>300	>1.0	716
Washington Street WB TR	A	6.9	0.53	392	A	7.1	0.56	423	A	7.1	0.55	423
Grove Street NB LTR	F	174.4	>1.0	351	F	205.6	>1.0	373	F	262.2	>1.0	411
Grove Street SB LTR	D	38.0	0.39	90	D	38.5	0.41	93	D	38.5	0.40	93
Washington Street NEB BR/R	C	25.9	0.32	126	C	26.4	0.34	132	C	26.6	0.34	132
<b>Overall</b>	<b>F</b>	<b>375.3</b>	<b>2.34</b>	-	<b>F</b>	<b>399.7</b>	<b>2.45</b>	-	<b>F</b>	<b>401.2</b>	<b>2.48</b>	-
<b>Wellesley Avenue at Washington Street (Signalized)</b>												
Washington Street EB T	C	31.5	0.74	329	C	30.8	0.74	369	C	30.6	0.74	369
Washington Street EB R	A	4.2	0.27	30	A	4.2	0.29	31	A	4.4	0.32	32
Washington Street WB LT/ T	C	21.5	0.70	214	C	22.1	0.73	233	C	22.0	0.73	232
Wellesley Avenue NB LR	C	34.5	0.78	561	D	40.2	0.84	600	D	40.8	0.84	601
<b>Overall</b>	<b>C</b>	<b>23.2</b>	<b>0.79</b>	-	<b>C</b>	<b>24.8</b>	<b>0.84</b>	-	<b>C</b>	<b>24.4</b>	<b>0.84</b>	-
<b>Cameron Street at Washington Street (Signalized)</b>												
Washington Street EB T/ TR	A	4.8	0.36	94	A	4.9	0.38	97	A	4.9	0.38	97
Washington Street WB T/ LT	A	4.3	0.42	187	A	4.4	0.44	200	A	4.4	0.44	200
Cameron Street NB R	D	35.0	0.06	0	D	35.4	0.09	0	D	36.0	0.13	0
<b>Overall</b>	<b>A</b>	<b>6.2</b>	<b>0.40</b>	-	<b>A</b>	<b>6.7</b>	<b>0.42</b>	-	<b>A</b>	<b>7.7</b>	<b>0.42</b>	-

Table 9: AM Peak Hour Capacity Analysis Results (Existing and Future 2026)

INTERSECTION	Existing Conditions				2026 No-Build Conditions				2026 Build Conditions			
	LOS	Delay (s/veh)	v/c	95th % Queue	LOS	Delay (s/veh)	v/c	95th % Queue	LOS	Delay (s/veh)	v/c	95th % Queue
<b>Library Lot at Washington Street (Unsignalized)</b>												
Washington Street WB L	A	0.9	0.02	2	A	1.0	0.03	2	A	1.1	0.03	2
Library Lot NB R	A	0.0	0.00	0	B	10.5	0.04	3	B	10.5	0.04	3
<b>Grove Street at Spring Street (Unsignalized)</b>												
Spring Street WB LR	B	12.2	0.24	23	B	12.7	0.27	27	B	13.3	0.32	35
Grove Street SB LT	A	1.3	0.02	1	A	1.3	0.02	1	A	1.1	0.02	1
<b>Grove Street at Hampden Street (Unsignalized)</b>												
Hampden Street WB LR	B	14.0	0.26	26	C	15.1	0.3	31	C	15.9	0.32	34
Grove Street SB LT	A	3.5	0.04	3	A	3.6	0.05	4	A	4.4	0.07	6
<b>Hampden Street at Cameron Street (Unsignalized)</b>												
Hampden Street EB LT	A	3.9	0.13	12	A	4.0	0.15	13	A	4.7	0.19	17
Cameron Street SB LR	B	12.8	0.08	6	B	13.3	0.09	7	B	14.4	0.10	8
<b>Brook Street at Hampden Street (Unsignalized)</b>												
Hampden Street EB LR	B	14.9	0.39	47	C	16.6	0.45	58	C	20.2	0.52	74
Brook Street NB LT	A	6.5	0.15	13	A	6.6	0.16	14	A	7.1	0.21	19
<b>Washington Street at Grove Street and Central Street (Signalized)</b>												
Central Street EB LT/ TR	D	52.7	0.90	558	E	65.9	0.98	631	F	73.3	>1.0	655
Washington Street WB L	F	>300	>1.0	510	F	>300	>1.0	549	F	>300	>1.0	549
Washington Street WB TR	B	11.6	0.51	428	B	12.3	0.55	480	B	12.3	0.55	480
Grove Street NB LTR	F	103.6	0.99	403	F	126.9	>1.0	443	F	162.2	>1.0	491
Grove Street SB LTR	D	42.7	0.35	105	D	42.9	0.36	108	D	42.8	0.36	108
Washington Street NEB BR/R	D	45.5	0.71	290	D	48.7	0.78	348	D	48.7	0.78	348
<b>Overall</b>	<b>F</b>	<b>159.8</b>	<b>&gt;1.0</b>	-	<b>F</b>	<b>180.2</b>	<b>&gt;1.0</b>	-	<b>F</b>	<b>185.2</b>	<b>&gt;1.0</b>	-
<b>Wellesley Avenue at Washington Street (Signalized)</b>												
Washington Street EB T	C	34.6	0.91	643	D	50.1	0.99	717	D	50.1	0.99	717
Washington Street EB R	A	2.1	0.46	26	A	2.2	0.50	26	A	2.4	0.53	27
Washington Street WB LT/ T	B	15.9	0.52	152	F	17.3	>1.0	173	F	17.3	>1.0	173
Wellesley Avenue NB LR	D	36.2	0.88	503	D	48.0	0.95	559	D	48.0	0.95	559
<b>Overall</b>	<b>C</b>	<b>21.8</b>	<b>0.91</b>	-	<b>C</b>	<b>29.2</b>	<b>0.99</b>	-	<b>C</b>	<b>28.8</b>	<b>0.99</b>	-
<b>Cameron Street at Washington Street (Signalized)</b>												
Washington Street EB T/ TR	A	8.7	0.74	210	B	10.0	0.80	318	B	10.1	0.80	276
Washington Street WB T/ LT	A	3.1	0.31	134	A	3.2	0.34	148	A	3.2	0.34	148
Cameron Street NB R	D	39.8	0.09	0	D	39.8	0.10	0	D	40.5	0.16	0
<b>Overall</b>	<b>A</b>	<b>8.8</b>	<b>0.60</b>	-	<b>A</b>	<b>9.6</b>	<b>0.65</b>	-	<b>B</b>	<b>10.8</b>	<b>0.65</b>	-

Table 10: PM Peak Hour Capacity Analysis Results (Existing and Future 2026)

INTERSECTION	Existing Conditions				2026 No-Build Conditions				2026 Build Conditions			
	LOS	Delay (s/veh)	v/c	95th % Queue	LOS	Delay (s/veh)	v/c	95th % Queue	LOS	Delay (s/veh)	v/c	95th % Queue
<b>Library Lot at Washington Street (Unsignalized)</b>												
Washington Street WB L	A	1.3	0.04	3	A	1.3	0.04	3	A	1.4	0.04	3
Library Lot NB R	B	10.9	0.10	8	B	10.2	0.09	8	B	10.4	0.10	8
<b>Grove Street at Spring Street (Unsignalized)</b>												
Spring Street WB LR	B	12.0	0.30	32	B	12.5	0.34	37	B	13.0	0.38	44
Grove Street SB LT	A	0.7	0.10	1	A	0.07	0.01	1	A	0.6	0.01	1
<b>Grove Street at Hampden Street (Unsignalized)</b>												
Hampden Street WB LR	B	13.2	0.32	34	B	14.1	0.36	41	C	15.3	0.39	46
Grove Street SB LT	A	1.0	0.02	1	A	1.0	0.02	2	A	1.8	0.04	3
<b>Hampden Street at Cameron Street (Unsignalized)</b>												
Hampden Street EB LT	A	4.1	0.05	4	A	4.2	0.06	5	A	5.0	0.08	7
Cameron Street SB LR	A	10.0	0.02	2	B	10.1	0.02	2	B	10.4	0.03	2
<b>Brook Street at Hampden Street (Unsignalized)</b>												
Hampden Street EB LR	B	10.0	0.09	7	B	10.2	0.1	8	B	10.7	0.10	9
Brook Street NB LT	A	6.5	0.09	8	A	6.6	0.1	8	A	6.9	0.13	11
<b>Washington Street at Grove Street and Central Street (Signalized)</b>												
Central Street EB LT/ TR	D	35.8	0.74	302	D	37.3	0.78	343	D	38.3	0.80	362
Washington Street WB L	F	>300	>1.0	686	F	>300	>1.0	733	F	>300	>1.0	733
Washington Street WB TR	A	6.9	0.53	392	A	7.3	0.57	442	A	7.2	0.60	442
Grove Street NB LTR	F	174.4	>1.0	351	F	227.7	>1.0	384	F	286.1	>1.0	422
Grove Street SB LTR	D	38.0	0.39	90	D	38.9	0.43	95	D	38.9	0.42	95
Washington Street NEB BR/R	C	25.9	0.32	126	C	26.8	0.35	136	C	27.0	0.36	136
<b>Overall</b>	<b>F</b>	<b>&gt;300</b>	<b>&gt;1.0</b>	-	<b>F</b>	<b>&gt;300</b>	<b>&gt;1.0</b>	-	<b>F</b>	<b>&gt;300</b>	<b>&gt;1.0</b>	-
<b>Wellesley Avenue at Washington Street (Signalized)</b>												
Washington Street EB T	C	31.5	0.74	329	C	30.2	0.74	388	C	30.0	0.73	388
Washington Street EB R	A	4.2	0.27	30	A	4.2	0.29	31	A	4.3	0.33	32
Washington Street WB LT/ T	C	21.5	0.7	214	C	22.3	0.74	251	C	22.1	0.73	251
Wellesley Avenue NB LR	C	34.5	0.78	561	D	45.3	0.88	625	D	46.2	0.88	625
<b>Overall</b>	<b>C</b>	<b>23.2</b>	<b>0.79</b>	-	<b>C</b>	<b>26.1</b>	<b>0.86</b>	-	<b>C</b>	<b>25.7</b>	<b>0.86</b>	-
<b>Cameron Street at Washington Street (Signalized)</b>												
Washington Street EB T/ TR	A	4.8	0.36	94	A	4.9	0.39	101	A	4.9	0.39	100
Washington Street WB T/ LT	A	4.3	0.42	187	A	4.5	0.46	207	A	4.5	0.46	207
Cameron Street NB R	D	35.0	0.06	0	D	35.7	0.09	0	D	36.2	0.14	0
<b>Overall</b>	<b>A</b>	<b>6.2</b>	<b>0.40</b>	-	<b>A</b>	<b>6.8</b>	<b>0.43</b>	-	<b>A</b>	<b>7.8</b>	<b>0.43</b>	-

For the five unsignalized study intersections, all intersection movements will operate at LOS C or better for all scenarios (Existing, No-Build, and Build). Intersections will remain operating at acceptable conditions and will experience only minor increases in delay and queuing as a result of the addition of redistricted school traffic.

The signalized intersection of Washington Street at Grove Street and Central Street currently operates at LOS F in both the AM and School PM peak hours with long delays and queue lengths. The Cameron Street at Washington Street signalized intersection operates at LOS A in both peak hours. The Wellesley Avenue at Washington Street signalized study intersection operates at LOS C in both peak hours. While the intersection of Washington Street and Wellesley Avenue currently operates with an acceptable LOS, the eastbound and northbound approaches experience long queue lengths during both peak hours.

For the 2023 and 2026 No-Build conditions at signalized intersections, background traffic volumes would slightly increase vehicle delay and queuing over Existing conditions for both peak hours. For the 2023 No-Build conditions, the intersection of Washington Street at Grove Street and Central Street would experience a 10 second increase in overall delay in the AM peak hour and a 24 second increase in overall delay in the PM peak hour. For the 2026 No-Build condition, the intersection would experience a 20 second and 46 second increase in overall delay in the AM and PM peak hours, respectively. Overall intersection LOS for Existing Conditions would not change as a result of background traffic volumes.

For the 2023 and 2026 Build conditions, the intersection of Washington Street at Grove Street and Central Street would continue to operate at LOS F conditions in both peak hours with long delays and queuing. The additional redistricted project traffic (approximately 19 trips) would result in minor increases in overall intersection delay for both 2023 and 2026. The Grove Street northbound movement would experience the largest impact with between 30 and 40 seconds of additional delay in the AM peak hour and between 60 and 80 seconds of additional delay in the PM peak hour due to the redistricted traffic. At the remaining two signalized intersections, redistricted school traffic would result in only minor increases in delay (4 seconds or less in overall intersection delay) and queuing during both peak hours for year 2023 and 2026. The Wellesley Avenue at Washington Street intersection slightly improves overall as the redistricting assumes fewer vehicles at this intersection.

### 4.3 WALKING STUDENT SENSITIVITY ANALYSIS

As discussed in **Section 3.2.2 Mode Split**, this evaluation assumes no credit for walking trips which is conservative based on the 2016 mode split survey for Hunnewell School (7-13% by bus, 23-33% Walk and 60-64% by auto). BETA performed a basic sensitivity analysis for the Washington Street at Grove Street and Central Street traffic signal which experiences an increase in 23 to 27 seconds of delay, in the AM peak hour, and 43 to 47 seconds of delay, in the PM peak hour, due to the redistricted traffic (19 vehicles). This sensitivity analysis assumed various reductions in vehicle trips to account for walking trips to and from the school. As a result, it was found that each redistricted vehicle trip represents approximately 1-2 seconds of increased delay in the AM peak hour and approximately 2-3 seconds of increased delay in the PM peak hour for the Grove Street approach to the traffic signal. The reduction in vehicle trips was found to have a minimal effect on the overall intersection delay.

## 5.0 SITE ACCESS, CIRCULATION AND PARKING

The proposed school site design, prepared by SMMA and shown in **Figure 18**, follows a similar pattern to the existing layout. Two parking areas ( $\pm 55$  total spaces) are proposed in front of the school adjacent to Cameron Street. This represents an increase of 14 spaces over existing conditions. The parking supply is expected to be adequate to accommodate future primarily teacher and staff parking demand. It is

acknowledged that Cameron Street and adjacent parking areas are used temporarily by parents. Both parking areas are intended to provide two-way travel. The southern (right side of image) parking area is surrounded by a half-circle driveway aisle accessed by two curb cuts on Cameron Street. The half-circle is expected to operate with a one-way (counterclockwise) circulation and will provide drop-off and pick-up space for the school. Parking is not intended within this access aisle.



Figure 18: Site Plan (Source: SMMA, dated 02/12/2020)

In addition to on-site accommodations, the school design provides two on-street passenger loading bays adjacent to the school on the northbound side of Cameron Street. Under existing conditions vehicles queue in these areas and block portions of the roadway. The proposed bays will allow vehicles to pull off the roadway and will not conflict with travel flow along Cameron Street.

## 5.1 FREIGHT AND EMERGENCY SERVICES

The proposed concept provides a loading area on the southern (right side of image) side of the school, which doubles as an emergency access path to the rear-Library Lot. Based on school layout plans, the rear/side loading dock will generally be used for all deliveries.

## 5.2 DROP-OFF AND PICK-UP OPERATIONS

The current temporary one-way condition on Cameron Street during the school drop-off and pick-up period is expected to be retained with the opening of the new school. This condition provides a flashing "Do Not Enter" sign south of the Library Lot's driveway. All traffic to the school must arrive from the south via Hampden Street and exit to the north via Cameron Street at Washington Street or Spring Street.

The school is expected to provide three (3) school buses that will service the district and a fourth bus during dismissal for the Wellesley Community Children's Center. The proposed site plan would accommodate the same circulation pattern during both morning drop-off and afternoon pick-up.

Circulation is summarized in **Figure 19** below. Bus travel is depicted by orange arrows; auto travel is depicted by blue arrows; pedestrians from vehicles are depicted by yellow dots; and all other walkers are depicted by magenta dots.

Buses are expected to utilize the half-circle driveway to unload and load students. The half-circle would be closed to all other vehicles during this time. Personal vehicles (autos) would utilize the on-street loading bay areas to unload and load. This allows personal vehicles to pull to the side of the road, unload/load, and continue traveling on Cameron Street with minimal turning maneuvers or delay. It is expected that with this configuration drivers can pull into the bay without having to parallel park around other vehicles. This configuration will require operations management by school staff to ensure that parents do not park in the loading bay. Even so, vehicle queues are expected to extend beyond the loading bays onto Cameron Street, blocking school driveways. It is noted that some parents will continue to park along Cameron Street and walk their children to school.

This condition will require signage to prohibit vehicles from entering the half-circle driveway for drop-off and pick-up purposes.



Figure 19: School Circulation (Source: SMMA)

### 5.3 SIGHT DISTANCE EVALUATION

Sight distance is the length of roadway visible to the driver at a given time and position. To maintain safe driving conditions, the American Association of State Highway and Transportation Officials (AASHTO) requires minimum lengths of sight distance based on prevailing roadway conditions and speeds. For the purposes of this study, two forms of sight distance were evaluated: Stopping Sight Distance (SSD) and Intersection Sight Distance (ISD).

Stopping Sight Distance (SSD) is the minimum distance required for a driver to see, react, and stop before striking an object. This includes the distance traveled during a perception-reaction time of 2.5 seconds and the braking distance based on wet, level pavement. Corrections can be applied if the roadway is sloped or for changes in roadway friction characteristics. SSD is measured based on a driver eye height of 3.5 feet and an object height of 2 feet.

Intersection Sight Distance (ISD) is the minimum distance required for driver to exit a minor street onto a major street without being overtaken by an approaching vehicle reducing its speed by 30 percent. ISD is measured from a driver eye height of 3.5 feet to an object height of 3.5 feet. ISD requirements are based on the type of movement (left turn, right turn, etc.) and roadway conditions.

SSD is generally more important as it represents the minimum distance required to safely stop and avoid a crash. The recommended ISD is generally longer than the required SSD to reduce the stress on a driver exiting the minor road and maintain relatively uninterrupted flow on the major road. As a practice, an ISD of at least equal to the SSD for the major road is enough to maintain safe roadway operations.

Sight distance was evaluated on Friday, February 14<sup>th</sup>, 2020 at the proposed school driveways at Cameron Street. The following sight distance was measured:

#### Stopping Sight Distance

- Cameron Street northbound to school exit driveway = 398 feet
- Cameron Street southbound to school exit driveway = 573 feet

#### Intersection Sight Distance

- School exit driveway looking left (south) on Cameron Street = 302 feet
- School exit driveway looking right (north) on Cameron Street = 368 feet

The prevailing vehicle travel speed recorded on Cameron Street was 20 MPH during school arrival and dismissal periods (see **Section 2.5.4**). The required SSD speed for 20 MPH is 115 feet. The Required ISD for a left turn is 225 feet and for a right turn is 195 feet. The measured SSD and ISD exceed the required sight distances by AASHTO.

## 6.0 CONSTRUCTION TRAFFIC

Construction traffic shall arrive outside of the morning and evening peak commuting periods (7:00 – 9:00 AM and 4:00 – 6:00 PM) when Washington Street is significantly congested. Construction vehicles shall enter and exit Cameron Street (the site) via Spring Street and Washington Street. All construction parking and staging shall occur on-site and shall not impede operations of the Public Library and the Cameron Parking Lot.

## 7.0 RECOMMENDED MITIGATION AND IMPROVEMENTS

Based on the above evaluation, BETA recommends that drop-off and pick-up follow the same pattern for both the arrival and dismissal periods to reduce confusion. Since the half-circle drive provides more queue space, allowing autos to queue in the half-circle drive during both the morning and afternoon peaks can be considered with buses utilizing the on-street loading bays similar to operations today. Teachers and staff will be needed to manage the drop-off and pick-up operation within the half-circle to ensure safety and that vehicles do not park in this area.

BETA recommends the school join the MassDOT Safe Routes to School program. Several other elementary schools in the Town of Wellesley are already participating in the program which aims to educate parents and students on the benefits of walking and biking and safe walking procedures. The program also encourages walking and biking by holding special events and techniques such as forming walking school buses. The goal is to increase the number of students who walk and bike to school and to reduce the number of vehicles.

School zone signage on Cameron Street should be updated.

## 8.0 CONCLUSIONS

The BETA Group, Inc. (BETA) has evaluated the existing and future (years 2023 and 2026) traffic conditions at study intersections in the vicinity of the Hunnewell Elementary School in Wellesley, MA. BETA collected new vehicle, pedestrian and bicycle counts at seven study intersections during the school arrival and dismissal periods; conducted an 11-hour parking occupancy survey of public spaces in the study area; and observed operations and traffic circulation at the school during the arrival and dismissal periods. Future conditions were evaluated for both the existing school without redistricting of students (No-Build) and with a new Hunnewell School with additional redistricted students (Build). Two future conditions were evaluated: Year 2023 represents an “Early” completion year for a new Hunnewell School and Year 2026 represents a “Late” completion year. Both future conditions assume full enrollment and new redistricting.

The following summarizes the findings of the traffic report:

- Redistricting will add  $79\pm$  vehicle trips to Hunnewell School during the arrival and dismissal periods.
- The additional of redistricting vehicle trips will result in only minor delays at study intersections during the morning and afternoon peak periods. The intersection of Washington Street at Grove Street and Central Street would continue to operate at LOS F conditions in both peak hours with long delays and queuing.
- It is recommended that teachers and staff manage the drop-off and pick-up operation to ensure safety and that vehicles do not park long term disturbing or blocking flow.
- A total of 55 off-street parking spaces are proposed for the Hunnewell School, representing an increase of 14 spaces over existing conditions. The parking supply is expected to be adequate to accommodate future teacher and staff parking demand. It is acknowledged that Cameron Street and adjacent parking areas are used temporarily by parents.
- Update school zone signage on Cameron Street.
- It is recommended that on-street parking on the east side Cameron Street be retained.
- It is recommended that the Hunnewell School join the MassDOT Safe Routes to School program to encourage students to walk and bike to school and help reduce vehicle trips.
- Construction related traffic should be limited to off-peak periods during the weekdays and shall not impede operations of the Cameron Parking Lot and the Library Lot.

# **APPENDIX**

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- A. Turning Movement Count Data
- B. Analysis Worksheets
- C. Parking Survey
- D. Hunnewell School AM and PM Procedures
- E. Safety Analysis
- F. 2016 Mode Split Survey

# APPENDIX A

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- Turning Movement Count Data

# Accurate Counts

978-664-2565

N/S Street : Grove St / Washington St  
 E/W Street : Washington St / Central St  
 City/State : Wellesley, MA  
 Weather : Cloudy

File Name : 547J0001  
 Site Code : 54700001  
 Start Date : 9/25/2018  
 Page No : 1

## Groups Printed- Cars - Trucks

Start Time	Grove St From North				Washington St From East				Grove St From Southeast				Washington St From South				Central St From West				Int. Total
	Left	BrLt	Thru	Right	HdLt	Left	Thru	Right	HdLt	BrLt	BrRt	HdRt	Left	Thru	Right	HdRt	Left	Thru	BrRt	Right	
07:00 AM	3	2	0	0	2	26	47	3	1	12	3	7	0	0	112	1	0	189	13	3	424
07:15 AM	5	4	2	0	0	38	64	3	2	27	4	8	0	0	117	0	0	166	11	0	451
07:30 AM	7	7	3	0	1	33	81	8	1	21	2	5	0	0	130	0	0	198	22	1	520
07:45 AM	11	4	0	0	1	46	89	3	0	33	7	13	0	0	121	0	0	170	29	1	528
Total	26	17	5	0	4	143	281	17	4	93	16	33	0	0	480	1	0	723	75	5	1923
08:00 AM	9	2	1	0	1	42	96	10	1	30	7	18	2	0	124	1	0	144	8	2	498
08:15 AM	11	9	1	1	3	33	109	8	4	36	2	10	0	0	81	0	0	182	5	3	498
08:30 AM	6	3	1	0	5	54	139	7	2	26	5	6	0	0	113	0	0	130	9	2	508
08:45 AM	13	5	2	0	3	43	86	5	2	12	6	15	0	0	105	0	0	145	11	4	457
Total	39	19	5	1	12	172	430	30	9	104	20	49	2	0	423	1	0	601	33	11	1961
Grand Total	65	36	10	1	16	315	711	47	13	197	36	82	2	0	903	2	0	1324	108	16	3884
Apprch %	58	32.1	8.9	0.9	1.5	28.9	65.3	4.3	4	60.1	11	25	0.2	0	99.6	0.2	0	91.4	7.5	1.1	
Total %	1.7	0.9	0.3	0	0.4	8.1	18.3	1.2	0.3	5.1	0.9	2.1	0.1	0	23.2	0.1	0	34.1	2.8	0.4	
Cars	63	35	10	1	12	304	695	44	12	192	36	81	2	0	889	1	0	1305	102	15	3799
% Cars	96.9	97.2	100	100	75	96.5	97.7	93.6	92.3	97.5	100	98.8	100	0	98.4	50	0	98.6	94.4	93.8	97.8
Trucks	2	1	0	0	4	11	16	3	1	5	0	1	0	0	14	1	0	19	6	1	85
% Trucks	3.1	2.8	0	0	25	3.5	2.3	6.4	7.7	2.5	0	1.2	0	0	1.6	50	0	1.4	5.6	6.2	2.2

# Accurate Counts

978-664-2565

N/S Street : Grove St / Washington St  
 E/W Street : Washington St / Central St  
 City/State : Wellesley, MA  
 Weather : Cloudy

File Name : 547J0001  
 Site Code : 54700001  
 Start Date : 9/25/2018  
 Page No : 2

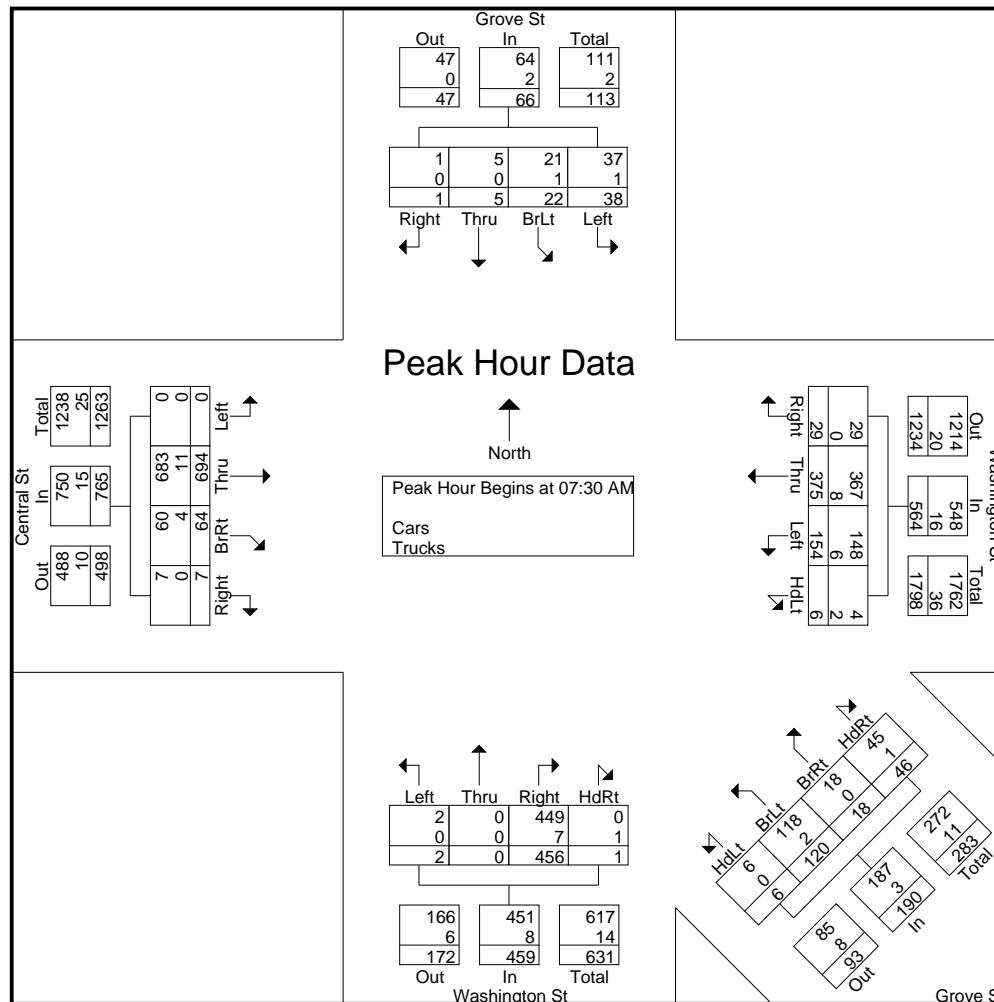
	Grove St					Washington St					Grove St					Washington St					Central St					
	From North					From East					From Southeast					From South					From West					
Start Time	Left	BrLt	Thru	Right	App. Total	HdLt	Left	Thru	Right	App. Total	HdLt	BrLt	BrRt	HdRt	App. Total	Left	Thru	Right	HdRt	App. Total	Left	Thru	BrRt	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 07:30 AM																										
07:30 AM	7	7	3	0	17	1	33	81	8	123	1	21	2	5	29	0	0	130	0	130	0	198	22	1	221	520
07:45 AM	11	4	0	0	15	1	46	89	3	139	0	33	7	13	53	0	0	121	0	121	0	170	29	1	200	528
08:00 AM	9	2	1	0	12	1	42	96	10	149	1	30	7	18	56	2	0	124	1	127	0	144	8	2	154	498
08:15 AM	11	9	1	1	22	3	33	109	8	153	4	36	2	10	52	0	0	81	0	81	0	182	5	3	190	498
Total Volume	38	22	5	1	66	6	154	375	29	564	6	120	18	46	190	2	0	456	1	459	0	694	64	7	765	2044
% App. Total	57.6	33.3	7.6	1.5		1.1	27.3	66.5	5.1		3.2	63.2	9.5	24.2		0.4	0	99.3	0.2		0	90.7	8.4	0.9		
PHF	.864	.611	.417	.250	.750	.500	.837	.860	.725	.922	.375	.833	.643	.639	.848	.250	.000	.877	.250	.883	.000	.876	.552	.583	.865	.968
Cars	37	21	5	1	64	4	148	367	29	548	6	118	18	45	187	2	0	449	0	451	0	683	60	7	750	2000
% Cars	97.4	95.5	100	100	97.0	66.7	96.1	97.9	100	97.2	100	98.3	100	97.8	98.4	100	0	98.5	0	98.3	0	98.4	93.8	100	98.0	97.8
Trucks	1	1	0	0	2	2	6	8	0	16	0	2	0	1	3	0	0	7	1	8	0	11	4	0	15	44
% Trucks	2.6	4.5	0	0	3.0	33.3	3.9	2.1	0	2.8	0	1.7	0	2.2	1.6	0	0	1.5	100	1.7	0	1.6	6.3	0	2.0	2.2

# Accurate Counts

978-664-2565

N/S Street : Grove St / Washington St  
 E/W Street : Washington St / Central St  
 City/State : Wellesley, MA  
 Weather : Cloudy

File Name : 547J0001  
 Site Code : 54700001  
 Start Date : 9/25/2018  
 Page No : 3



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

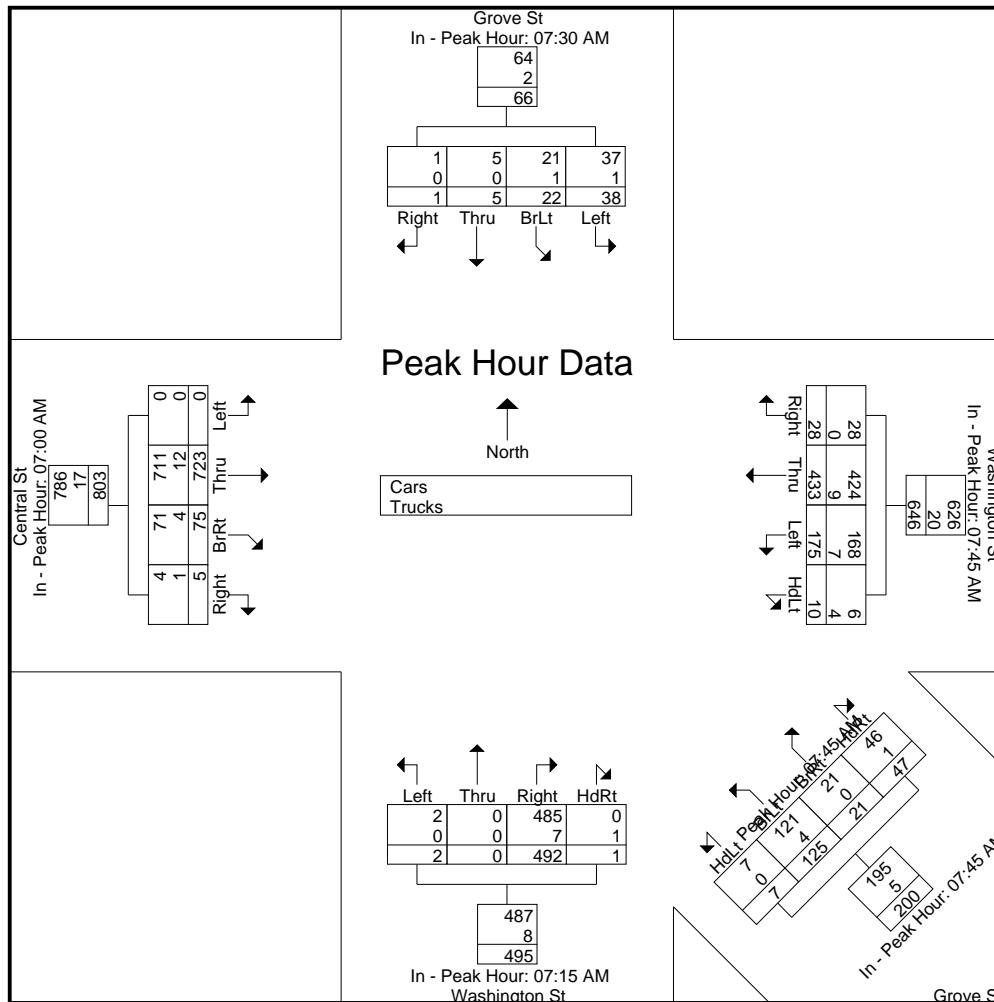
Peak Hour for Each Approach Begins at:

	07:30 AM					07:45 AM					07:45 AM					07:15 AM					07:00 AM				
+0 mins.	7	7	3	0	17	1	46	89	3	139	0	33	7	13	53	0	0	117	0	117	0	189	13	3	205
+15 mins.	11	4	0	0	15	1	42	96	10	149	1	30	7	18	56	0	0	130	0	130	0	166	11	0	177
+30 mins.	9	2	1	0	12	3	33	109	8	153	4	36	2	10	52	0	0	121	0	121	0	198	22	1	221
+45 mins.	11	9	1	1	22	5	54	139	7	205	2	26	5	6	39	2	0	124	1	127	0	170	29	1	200
Total Volume	38	22	5	1	66	10	175	433	28	646	7	125	21	47	200	2	0	492	1	495	0	723	75	5	803
% App. Total	57.6	33.3	7.6	1.5		1.5	27.1	67	4.3		3.5	62.5	10.5	23.5		0.4	0	99.4	0.2		0	90	9.3	0.6	

# Accurate Counts

978-664-2565

PHF	.864	.611	.417	.250	.750	.500	.810	.779	.700	.788	.438	.868	.750	.653	.893	.250	.000	.946	.250	.952	.000	.913	.647	.417	.908
Cars	37	21	5	1	64	6	168	424	28	626	7	121	21	46	195	2	0	485	0	487	0	711	71	4	786
% Cars	97.4	95.5	100	100	97	60	96	97.9	100	96.9	100	96.8	100	97.9	97.5	100	0	98.6	0	98.4	0	98.3	94.7	80	97.9
Trucks	1	1	0	0	2	4	7	9	0	20	0	4	0	1	5	0	0	7	1	8	0	12	4	1	17
% Trucks	2.6	4.5	0	0	3	40	4	2.1	0	3.1	0	3.2	0	2.1	2.5	0	0	1.4	100	1.6	0	1.7	5.3	20	2.1



# Accurate Counts

978-664-2565

N/S Street : Grove St / Washington St  
 E/W Street : Washington St / Central St  
 City/State : Wellesley, MA  
 Weather : Cloudy

File Name : 547J0001  
 Site Code : 54700001  
 Start Date : 9/25/2018  
 Page No : 5

## Groups Printed- Cars

	Grove St From North				Washington St From East				Grove St From Southeast				Washington St From South				Central St From West					
	Start Time	Left	BrLt	Thru	Right	HdLt	Left	Thru	Right	HdLt	BrLt	BrRt	HdRt	Left	Thru	Right	HdRt	Left	Thru	BrRt	Right	
07:00 AM		3	2	0	0	2	24	44	2	0	11	3	7	0	0	111	1	0	187	12	2	411
07:15 AM		5	4	2	0	0	38	64	2	2	27	4	8	0	0	115	0	0	162	10	0	443
07:30 AM		6	7	3	0	1	32	79	8	1	21	2	5	0	0	130	0	0	196	22	1	514
07:45 AM		11	3	0	0	1	44	87	3	0	33	7	12	0	0	118	0	0	166	27	1	513
Total		25	16	5	0	4	138	274	15	3	92	16	32	0	0	474	1	0	711	71	4	1881
08:00 AM		9	2	1	0	1	41	95	10	1	29	7	18	2	0	122	0	0	142	6	2	488
08:15 AM		11	9	1	1	1	31	106	8	4	35	2	10	0	0	79	0	0	179	5	3	485
08:30 AM		6	3	1	0	3	52	136	7	2	24	5	6	0	0	111	0	0	129	9	2	496
08:45 AM		12	5	2	0	3	42	84	4	2	12	6	15	0	0	103	0	0	144	11	4	449
Total		38	19	5	1	8	166	421	29	9	100	20	49	2	0	415	0	0	594	31	11	1918
Grand Total		63	35	10	1	12	304	695	44	12	192	36	81	2	0	889	1	0	1305	102	15	3799
Apprch %		57.8	32.1	9.2	0.9	1.1	28.8	65.9	4.2	3.7	59.8	11.2	25.2	0.2	0	99.7	0.1	0	91.8	7.2	1.1	
Total %		1.7	0.9	0.3	0	0.3	8	18.3	1.2	0.3	5.1	0.9	2.1	0.1	0	23.4	0	0	34.4	2.7	0.4	

# Accurate Counts

978-664-2565

N/S Street : Grove St / Washington St  
 E/W Street : Washington St / Central St  
 City/State : Wellesley, MA  
 Weather : Cloudy

File Name : 547J0001  
 Site Code : 54700001  
 Start Date : 9/25/2018  
 Page No : 6

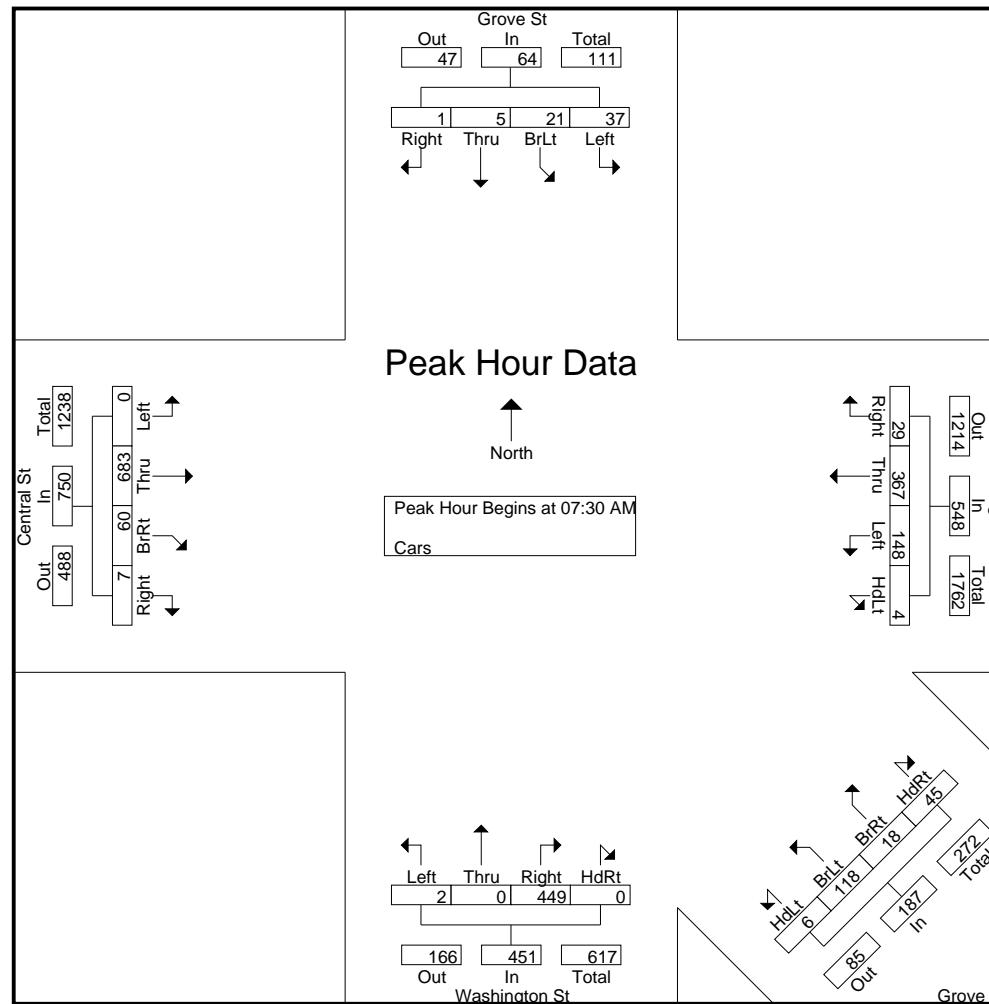
	Grove St					Washington St					Grove St					Washington St					Central St					
	From North					From East					From Southeast					From South					From West					
Start Time	Left	BrLt	Thru	Right	App. Total	HdLt	Left	Thru	Right	App. Total	HdLt	BrLt	BrRt	HdRt	App. Total	Left	Thru	Right	HdRt	App. Total	Left	Thru	BrRt	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 07:30 AM																										
07:30 AM	6	7	3	0	16	1	32	79	8	120	1	21	2	5	29	0	0	130	0	130	0	196	22	1	219	514
07:45 AM	11	3	0	0	14	1	44	87	3	135	0	33	7	12	52	0	0	118	0	118	0	166	27	1	194	513
08:00 AM	9	2	1	0	12	1	41	95	10	147	1	29	7	18	55	2	0	122	0	124	0	142	6	2	150	488
08:15 AM	11	9	1	1	22	1	31	106	8	146	4	35	2	10	51	0	0	79	0	79	0	179	5	3	187	485
Total Volume	37	21	5	1	64	4	148	367	29	548	6	118	18	45	187	2	0	449	0	451	0	683	60	7	750	2000
% App. Total	57.8	32.8	7.8	1.6		0.7	27	67	5.3		3.2	63.1	9.6	24.1		0.4	0	99.6	0		0	91.1	8	0.9		
PHF	.841	.583	.417	.250	.727	1.00	.841	.866	.725	.932	.375	.843	.643	.625	.850	.250	.000	.863	.000	.867	.000	.871	.556	.583	.856	.973

# Accurate Counts

978-664-2565

N/S Street : Grove St / Washington St  
 E/W Street : Washington St / Central St  
 City/State : Wellesley, MA  
 Weather : Cloudy

File Name : 547J0001  
 Site Code : 54700001  
 Start Date : 9/25/2018  
 Page No : 7



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

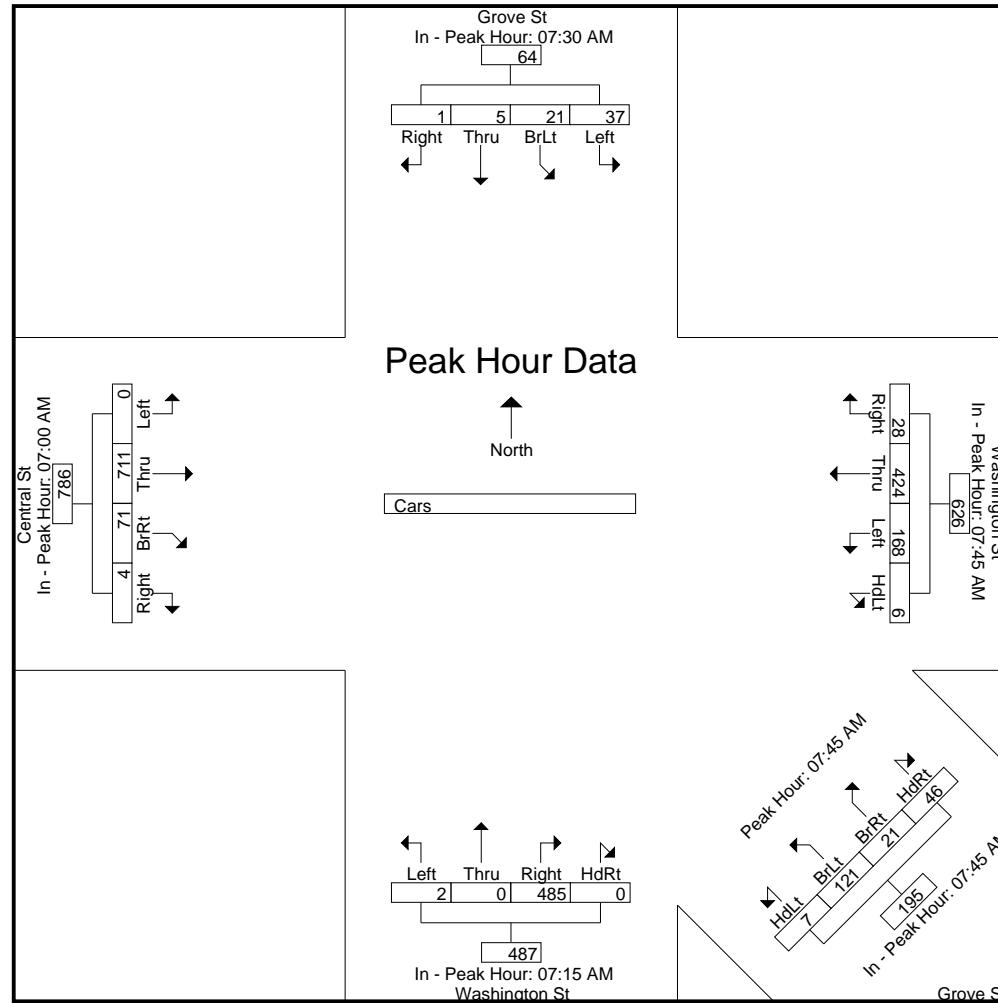
Peak Hour for Each Approach Begins at:

	07:30 AM					07:45 AM					07:45 AM					07:15 AM					07:00 AM				
+0 mins.	6	7	<b>3</b>	0	16	1	44	87	3	135	0	33	<b>7</b>	12	52	0	0	115	0	115	0	187	12	<b>2</b>	201
+15 mins.	11	3	0	0	14	1	41	95	<b>10</b>	147	1	29	7	<b>18</b>	<b>55</b>	0	0	<b>130</b>	0	<b>130</b>	0	162	10	0	172
+30 mins.	9	2	1	0	12	1	31	106	8	146	<b>4</b>	<b>35</b>	2	10	51	0	0	118	0	118	0	<b>196</b>	22	1	<b>219</b>
+45 mins.	11	<b>9</b>	1	1	<b>22</b>	<b>3</b>	<b>52</b>	<b>136</b>	7	<b>198</b>	2	24	5	6	37	<b>2</b>	0	122	0	124	0	166	<b>27</b>	1	194
Total Volume	37	21	5	1	64	6	168	424	28	626	7	121	21	46	195	2	0	485	0	487	0	711	71	4	786
% App. Total	57.8	32.8	7.8	1.6		1	26.8	67.7	4.5		3.6	62.1	10.8	23.6		0.4	0	99.6	0		0	90.5	9	0.5	

# Accurate Counts

978-664-2565

PHF	.841	.583	.417	.250	.727	.500	.808	.779	.700	.790	.438	.864	.750	.639	.886	.250	.000	.933	.000	.937	.000	.907	.657	.500	.897
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# Accurate Counts

978-664-2565

N/S Street : Grove St / Washington St  
 E/W Street : Washington St / Central St  
 City/State : Wellesley, MA  
 Weather : Cloudy

File Name : 547J0001  
 Site Code : 54700001  
 Start Date : 9/25/2018  
 Page No : 9

## Groups Printed- Trucks

	Grove St From North				Washington St From East				Grove St From Southeast				Washington St From South				Central St From West					
	Start Time	Left	BrLt	Thru	Right	HdLt	Left	Thru	Right	HdLt	BrLt	BrRt	HdRt	Left	Thru	Right	HdRt	Left	Thru	BrRt	Right	
07:00 AM		0	0	0	0	0	2	3	1	1	1	0	0	0	0	1	0	0	2	1	1	13
07:15 AM		0	0	0	0	0	0	0	1	0	0	0	0	0	0	2	0	0	4	1	0	8
07:30 AM		1	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	2	0	0	6
07:45 AM		0	1	0	0	0	2	2	0	0	0	0	1	0	0	3	0	0	4	2	0	15
Total		1	1	0	0	0	5	7	2	1	1	0	1	0	0	6	0	0	12	4	1	42
08:00 AM		0	0	0	0	0	1	1	0	0	1	0	0	0	0	2	1	0	2	2	0	10
08:15 AM		0	0	0	0	2	2	3	0	0	1	0	0	0	0	2	0	0	3	0	0	13
08:30 AM		0	0	0	0	2	2	3	0	0	2	0	0	0	0	2	0	0	1	0	0	12
08:45 AM		1	0	0	0	0	1	2	1	0	0	0	0	0	0	2	0	0	1	0	0	8
Total		1	0	0	0	4	6	9	1	0	4	0	0	0	0	8	1	0	7	2	0	43
Grand Total		2	1	0	0	4	11	16	3	1	5	0	1	0	0	14	1	0	19	6	1	85
Apprch %		66.7	33.3	0	0	11.8	32.4	47.1	8.8	14.3	71.4	0	14.3	0	0	93.3	6.7	0	73.1	23.1	3.8	
Total %		2.4	1.2	0	0	4.7	12.9	18.8	3.5	1.2	5.9	0	1.2	0	0	16.5	1.2	0	22.4	7.1	1.2	

**Accurate Counts**

978-664-2565

N/S Street : Grove St / Washington St  
 E/W Street : Washington St / Central St  
 City/State : Wellesley, MA  
 Weather : Cloudy

File Name : 547J0001  
 Site Code : 54700001  
 Start Date : 9/25/2018  
 Page No : 10

	Grove St					Washington St					Grove St					Washington St					Central St					
	From North					From East					From Southeast					From South					From West					
Start Time	Left	BrLt	Thru	Right	App. Total	HdLt	Left	Thru	Right	App. Total	HdLt	BrLt	BrRt	HdRt	App. Total	Left	Thru	Right	HdRt	App. Total	Left	Thru	BrRt	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:45 AM

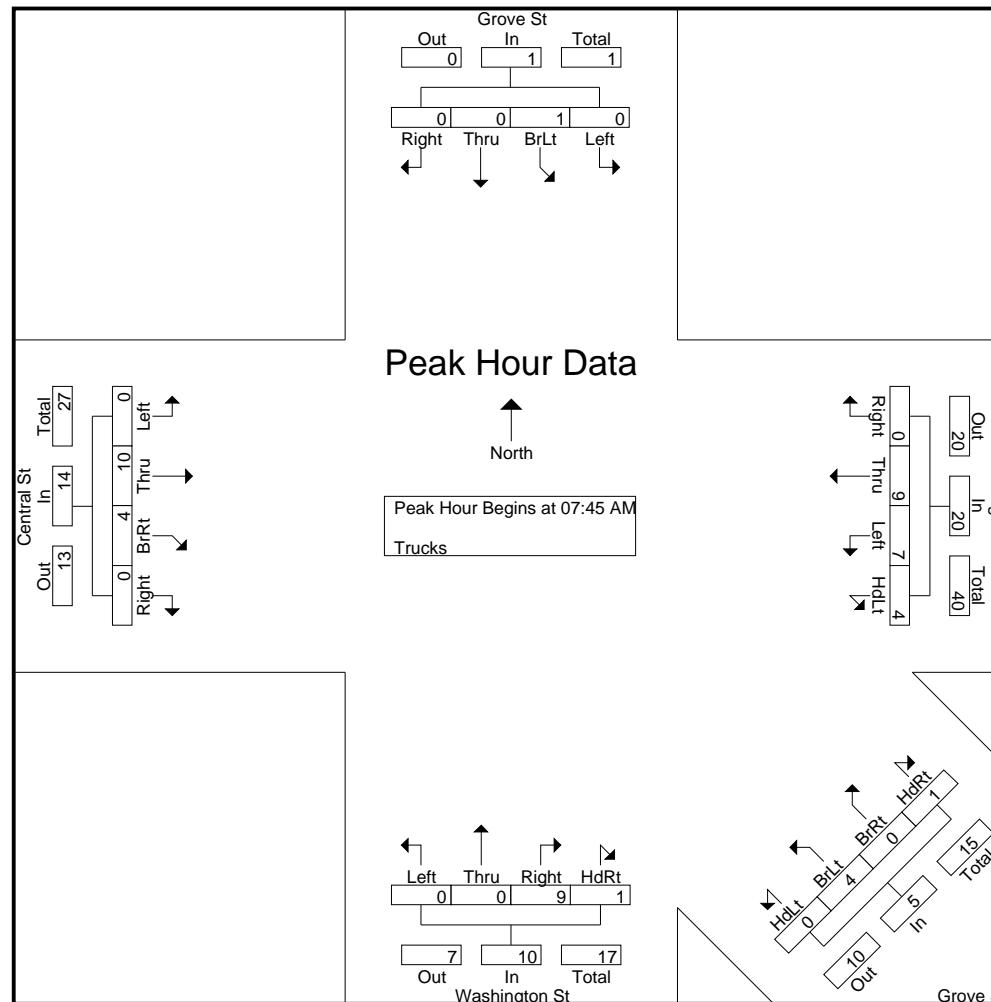
07:45 AM	0	1	0	0	1	0	2	2	0	4	0	0	0	1	1	0	0	3	0	3	0	4	2	0	6	15	
08:00 AM	0	0	0	0	0	0	1	1	0	2	0	1	0	0	1	0	0	2	1	3	0	2	2	0	4	10	
08:15 AM	0	0	0	0	0	0	2	2	3	0	7	0	1	0	0	1	0	0	2	0	2	0	3	0	0	3	13
08:30 AM	0	0	0	0	0	0	2	2	3	0	7	0	2	0	0	2	0	0	2	0	2	0	1	0	0	1	12
Total Volume	0	1	0	0	1	4	7	9	0	20	0	4	0	1	5	0	0	9	1	10	0	10	4	0	14	50	
% App. Total	0	100	0	0		20	35	45	0		0	80	0	20		0	0	90	10		0	71.4	28.6	0			
PHF	.000	.250	.000	.000	.250	.500	.875	.750	.000	.714	.000	.500	.000	.250	.625	.000	.000	.750	.250	.833	.000	.625	.500	.000	.583	.833	

# Accurate Counts

978-664-2565

N/S Street : Grove St / Washington St  
 E/W Street : Washington St / Central St  
 City/State : Wellesley, MA  
 Weather : Cloudy

File Name : 547J0001  
 Site Code : 54700001  
 Start Date : 9/25/2018  
 Page No : 11



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

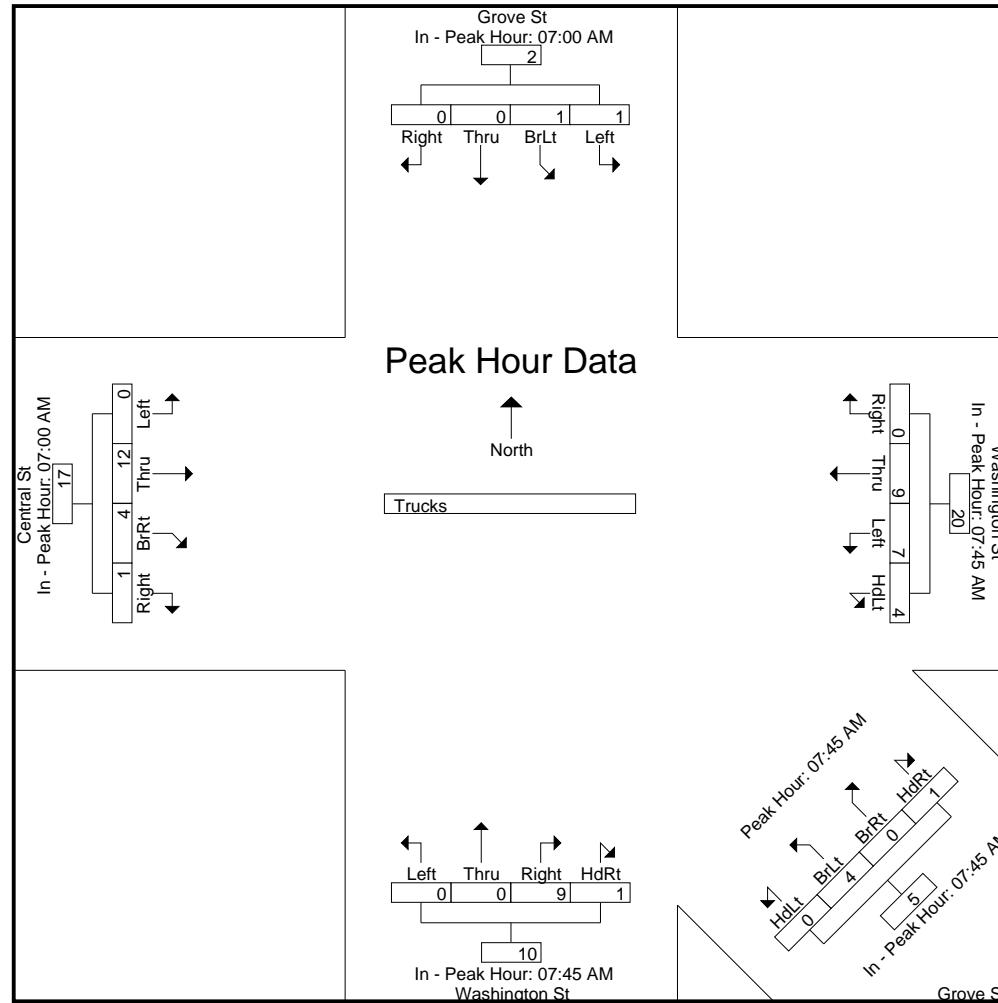
Peak Hour for Each Approach Begins at:

	07:00 AM					07:45 AM					07:45 AM					07:45 AM					07:00 AM					
+0 mins.	0	0	0	0	0	0	2	2	0	4	0	0	0	1	1	0	0	3	0	3	0	2	1	1	4	
+15 mins.	0	0	0	0	0	0	1	1	0	2	0	1	0	0	0	1	0	0	2	1	3	0	4	1	0	5
+30 mins.	1	0	0	0	1	2	2	3	0	7	0	1	0	0	0	1	0	0	2	0	2	0	2	0	0	2
+45 mins.	0	1	0	0	1	2	2	3	0	7	0	2	0	0	2	2	0	0	2	0	2	0	4	2	0	6
Total Volume	1	1	0	0	2	4	7	9	0	20	0	4	0	1	5	0	0	9	1	10	0	12	4	1	17	
% App. Total	50	50	0	0		20	35	45	0		0	80	0	20		0	0	90	10		0	70.6	23.5	5.9		

# Accurate Counts

978-664-2565

PHF	.250	.250	.000	.000	.500	.500	.875	.750	.000	.714	.000	.500	.000	.250	.625	.000	.000	.750	.250	.833	.000	.750	.500	.250	.708
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# Accurate Counts

978-664-2565

N/S Street : Grove St / Washington St  
 E/W Street : Washington St / Central St  
 City/State : Wellesley, MA  
 Weather : Cloudy

File Name : 547J0001  
 Site Code : 54700001  
 Start Date : 9/25/2018  
 Page No : 13

## Groups Printed- Bikes Peds

	Grove St From North					Washington St From East					Grove St From Southeast					Washington St From South					Central St From West					Exclu. Total	Inclu. Total	Int. Total	
	Start Time	Left	BrLt	Thru	Right	Peds	HdLt	Left	Thru	Right	Peds	HdLt	BrLt	BrRt	HdRt	Peds	Left	Thru	Right	HdRt	Peds	Left	Thru	BrRt	Right	Peds			
07:00 AM		0	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	3	2	5
07:15 AM		0	0	0	0	2	0	0	0	0	2	0	0	0	0	0	0	1	0	0	3	0	0	0	0	10	17	1	18
07:30 AM		0	0	0	0	2	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	4	3	7
07:45 AM		0	0	0	0	6	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	12	0	12
Total		0	0	0	0	11	0	0	4	0	6	0	0	0	0	0	0	1	0	0	4	0	1	0	0	15	36	6	42
08:00 AM		1	0	0	0	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	4	0	3	0	0	10	18	4	22
08:15 AM		0	0	0	0	5	0	0	0	0	6	0	0	0	0	0	1	1	0	0	1	0	1	0	0	2	14	3	17
08:30 AM		0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	1	4	1	5
08:45 AM		0	0	0	0	7	0	0	0	0	8	0	0	0	0	0	0	0	0	0	6	0	1	0	0	3	24	1	25
Total		1	0	0	0	16	0	0	0	0	15	0	0	0	0	0	1	1	1	0	13	0	5	0	0	16	60	9	69
Grand Total		1	0	0	0	27	0	0	4	0	21	0	0	0	0	0	1	2	1	0	17	0	6	0	0	31	96	15	111
Apprch %	100	0	0	0		0	0	100	0		0	0	0	0		25	50	25	0		0	100	0	0		0			
Total %	6.7	0	0	0		0	0	26.7	0		0	0	0	0		6.7	13.3	6.7	0		0	40	0	0		86.5	13.5		

# Accurate Counts

978-664-2565

N/S Street : Grove St / Washington St  
 E/W Street : Washington St / Central St  
 City/State : Wellesley, MA  
 Weather : Cloudy

File Name : 547J0001  
 Site Code : 54700001  
 Start Date : 9/25/2018  
 Page No : 14

Start Time	Grove St					Washington St					Grove St					Washington St					Central St					
	From North					From East					From Southeast					From South					From West					
	Left	BrLt	Thru	Right	App. Total	HdLt	Left	Thru	Right	App. Total	HdLt	BrLt	BrRt	HdRt	App. Total	Left	Thru	Right	HdRt	App. Total	Left	Thru	BrRt	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:30 AM

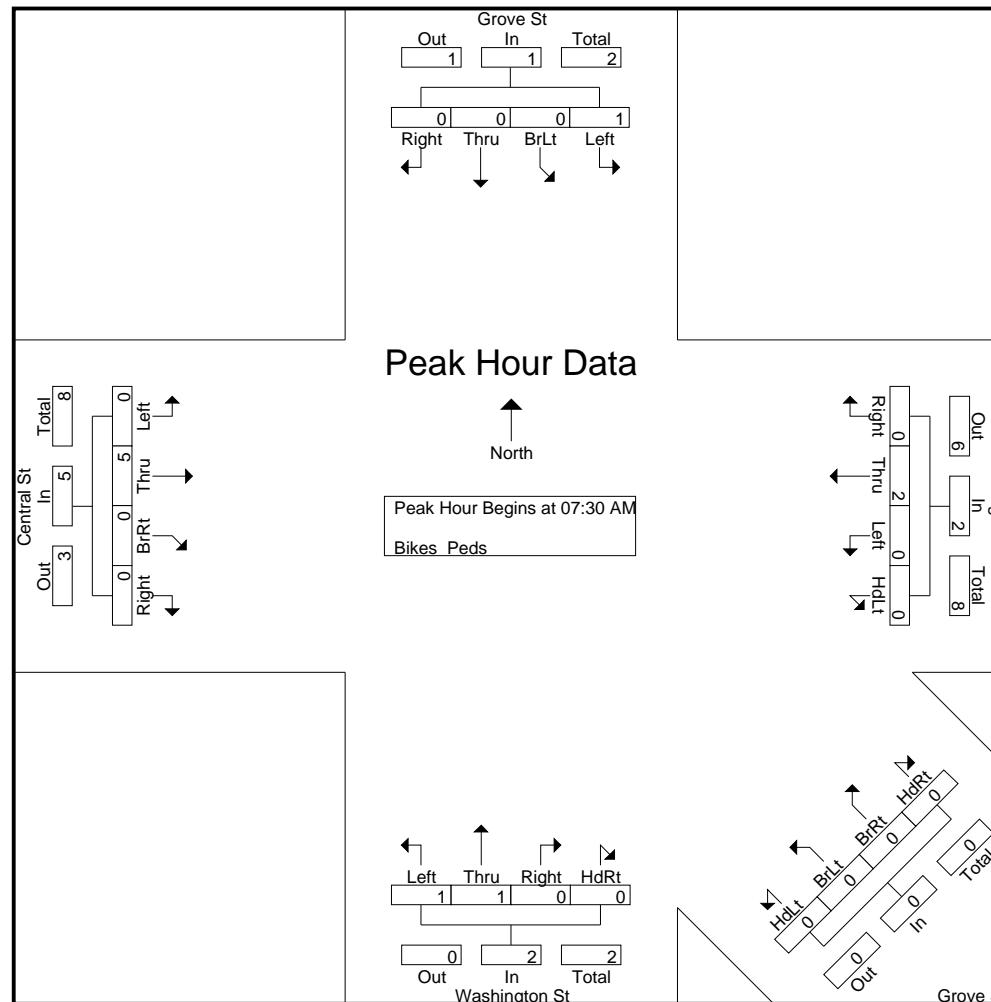
07:30 AM	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	3
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	4
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	0	1	0	0	1	3
Total Volume	1	0	0	0	1	0	0	2	0	2	0	0	0	0	0	1	1	0	0	2	0	5	0	0	5	10
% App. Total	100	0	0	0		0	0	100	0		0	0	0	0	0	50	50	0	0		0	100	0	0		
PHF	.250	.000	.000	.000	.250	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.250	.250	.000	.000	.250	.000	.417	.000	.000	.417	.625

# Accurate Counts

978-664-2565

N/S Street : Grove St / Washington St  
 E/W Street : Washington St / Central St  
 City/State : Wellesley, MA  
 Weather : Cloudy

File Name : 547J0001  
 Site Code : 54700001  
 Start Date : 9/25/2018  
 Page No : 15



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

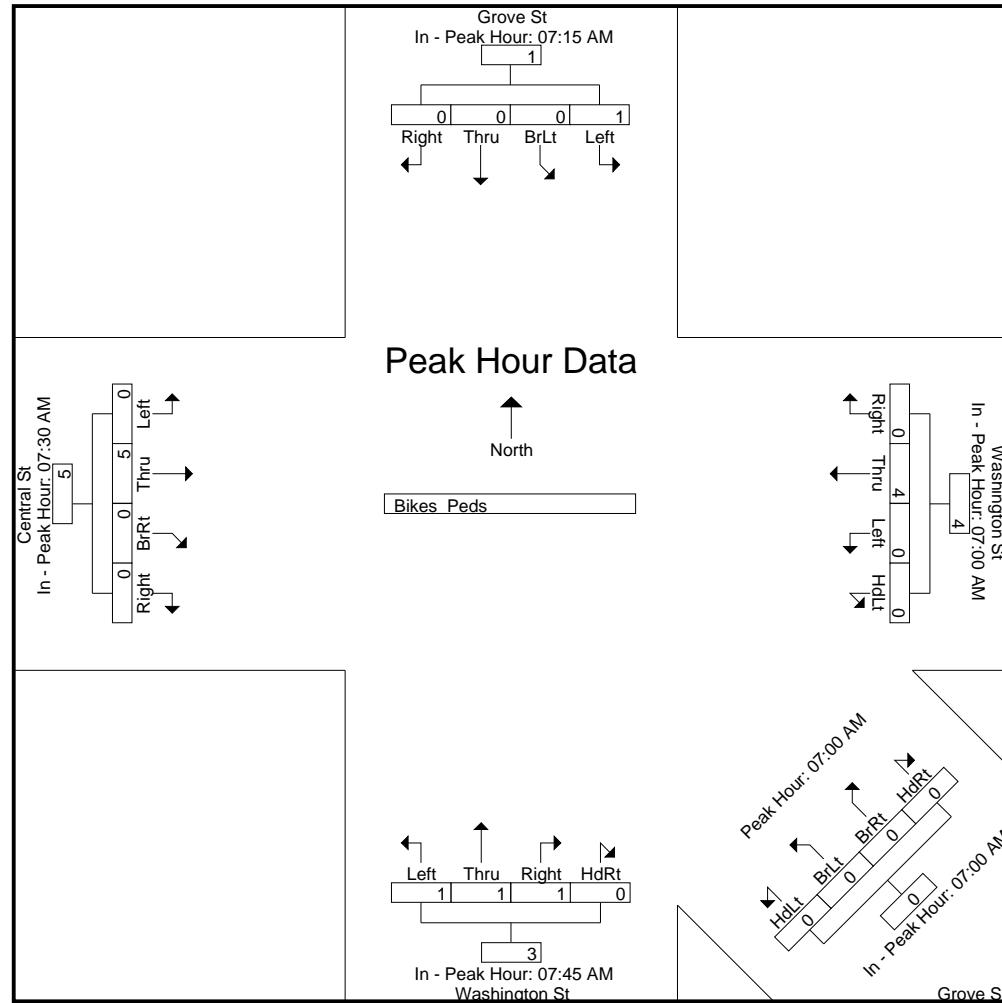
Peak Hour for Each Approach Begins at:

	07:15 AM					07:00 AM					07:00 AM					07:45 AM					07:30 AM					
+0 mins.	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	1	1	0	0	0	2	0	3	0	0
+45 mins.	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	1
Total Volume	1	0	0	0	0	1	0	0	4	0	4	0	0	0	0	0	1	1	1	0	3	0	5	0	0	5
% App. Total	100	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	33.3	33.3	33.3	0	0	100	0	0	0	

# Accurate Counts

978-664-2565

PHF	.250	.000	.000	.000	.250	.000	.000	.500	.500	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.250	.000	.375	.000	.417	.000	.000	.417
-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------



# Accurate Counts

978-664-2565

N/S Street : Grove St / Washington St  
 E/W Street : Washington St / Central St  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0001  
 Site Code : 54700001  
 Start Date : 9/25/2018  
 Page No : 1

## Groups Printed- Cars - Trucks

Start Time	Grove St From North				Washington St From East				Grove St From Southeast				Washington St From South				Central St From West				Int. Total
	Left	BrLt	Thru	Right	HdLt	Left	Thru	Right	HdLt	BrLt	BrRt	HdRt	Left	Thru	Right	HdRt	Left	Thru	BrRt	Right	
02:00 PM	11	4	2	1	3	57	82	7	3	23	6	12	0	0	42	0	0	71	25	9	358
02:15 PM	11	4	0	2	3	58	68	3	3	20	4	11	0	0	58	0	0	86	14	9	354
02:30 PM	5	3	3	1	1	58	121	2	0	21	2	8	2	0	57	1	0	79	28	9	401
02:45 PM	5	3	1	1	2	65	89	6	3	27	3	9	0	0	48	0	1	91	17	5	376
Total	32	14	6	5	9	238	360	18	9	91	15	40	2	0	205	1	1	327	84	32	1489
03:00 PM	9	2	1	2	0	68	113	6	4	21	3	14	0	0	55	0	1	92	27	5	423
03:15 PM	7	2	4	1	0	69	99	4	3	36	4	11	0	0	52	0	0	96	27	9	424
03:30 PM	9	3	4	1	0	79	89	8	1	32	4	11	0	0	39	0	0	90	25	3	398
03:45 PM	4	2	5	1	4	73	122	7	2	32	4	3	0	0	55	0	0	76	27	11	428
Total	29	9	14	5	4	289	423	25	10	121	15	39	0	0	201	0	1	354	106	28	1673
Grand Total	61	23	20	10	13	527	783	43	19	212	30	79	2	0	406	1	2	681	190	60	3162
Apprch %	53.5	20.2	17.5	8.8	1	38.6	57.3	3.1	5.6	62.4	8.8	23.2	0.5	0	99.3	0.2	0.2	73	20.4	6.4	
Total %	1.9	0.7	0.6	0.3	0.4	16.7	24.8	1.4	0.6	6.7	0.9	2.5	0.1	0	12.8	0	0.1	21.5	6	1.9	
Cars	59	23	20	10	12	525	776	42	19	209	30	79	2	0	405	1	2	674	188	60	3136
% Cars	96.7	100	100	100	92.3	99.6	99.1	97.7	100	98.6	100	100	100	0	99.8	100	100	99	98.9	100	99.2
Trucks	2	0	0	0	1	2	7	1	0	3	0	0	0	0	1	0	0	7	2	0	26
% Trucks	3.3	0	0	0	7.7	0.4	0.9	2.3	0	1.4	0	0	0	0	0.2	0	0	1	1.1	0	0.8

# Accurate Counts

978-664-2565

N/S Street : Grove St / Washington St  
 E/W Street : Washington St / Central St  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0001  
 Site Code : 54700001  
 Start Date : 9/25/2018  
 Page No : 2

	Grove St					Washington St					Grove St					Washington St					Central St					
	From North					From East					From Southeast					From South					From West					
Start Time	Left	BrLt	Thru	Right	App. Total	HdLt	Left	Thru	Right	App. Total	HdLt	BrLt	BrRt	HdRt	App. Total	Left	Thru	Right	HdRt	App. Total	Left	Thru	BrRt	Right	App. Total	Int. Total

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 03:00 PM

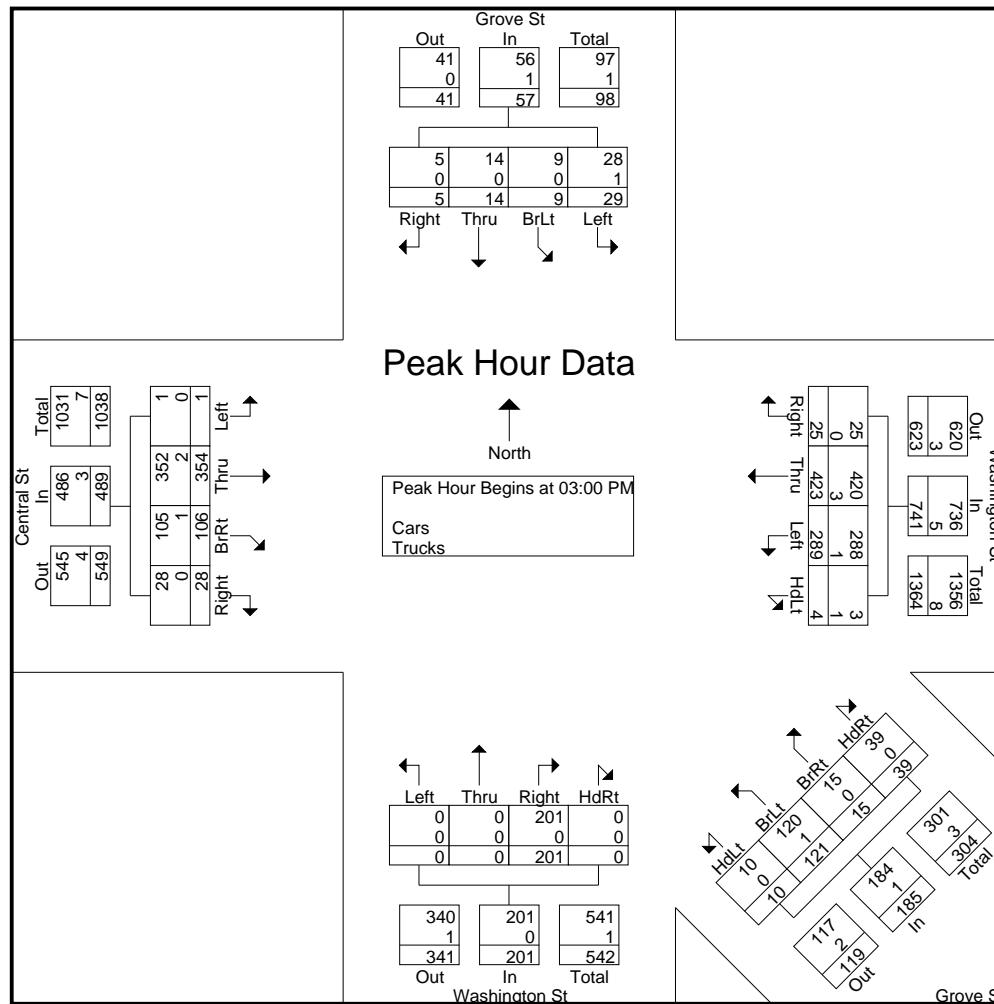
03:00 PM	9	2	1	2	14	0	68	113	6	187	4	21	3	14	42	0	0	55	0	55	1	92	27	5	125	423
03:15 PM	7	2	4	1	14	0	69	99	4	172	3	36	4	11	54	0	0	52	0	52	0	96	27	9	132	424
03:30 PM	9	3	4	1	17	0	79	89	8	176	1	32	4	11	48	0	0	39	0	39	0	90	25	3	118	398
03:45 PM	4	2	5	1	12	4	73	122	7	206	2	32	4	3	41	0	0	55	0	55	0	76	27	11	114	428
Total Volume	29	9	14	5	57	4	289	423	25	741	10	121	15	39	185	0	0	201	0	201	1	354	106	28	489	1673
% App. Total	50.9	15.8	24.6	8.8		0.5	39	57.1	3.4		5.4	65.4	8.1	21.1		0	0	100	0		0.2	72.4	21.7	5.7		
PHF	.806	.750	.700	.625	.838	.250	.915	.867	.781	.899	.625	.840	.938	.696	.856	.000	.000	.914	.000	.914	.250	.922	.981	.636	.926	.977
Cars	28	9	14	5	56	3	288	420	25	736	10	120	15	39	184	0	0	201	0	201	1	352	105	28	486	1663
% Cars	96.6	100	100	100	98.2	75.0	99.7	99.3	100	99.3	100	99.2	100	100	99.5	0	0	100	0	100	100	99.4	99.1	100	99.4	99.4
Trucks	1	0	0	0	1	1	1	3	0	5	0	1	0	0	1	0	0	0	0	0	0	2	1	0	3	10
% Trucks	3.4	0	0	0	1.8	25.0	0.3	0.7	0	0.7	0	0.8	0	0	0.5	0	0	0	0	0	0	0.6	0.9	0	0.6	0.6

## Accurate Counts

978-664-2565

N/S Street : Grove St / Washington St  
E/W Street : Washington St / Central St  
City/State : Wellesley, MA  
Weather : Rain

File Name : 547J0001  
Site Code : 54700001  
Start Date : 9/25/2018  
Page No : 3



Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

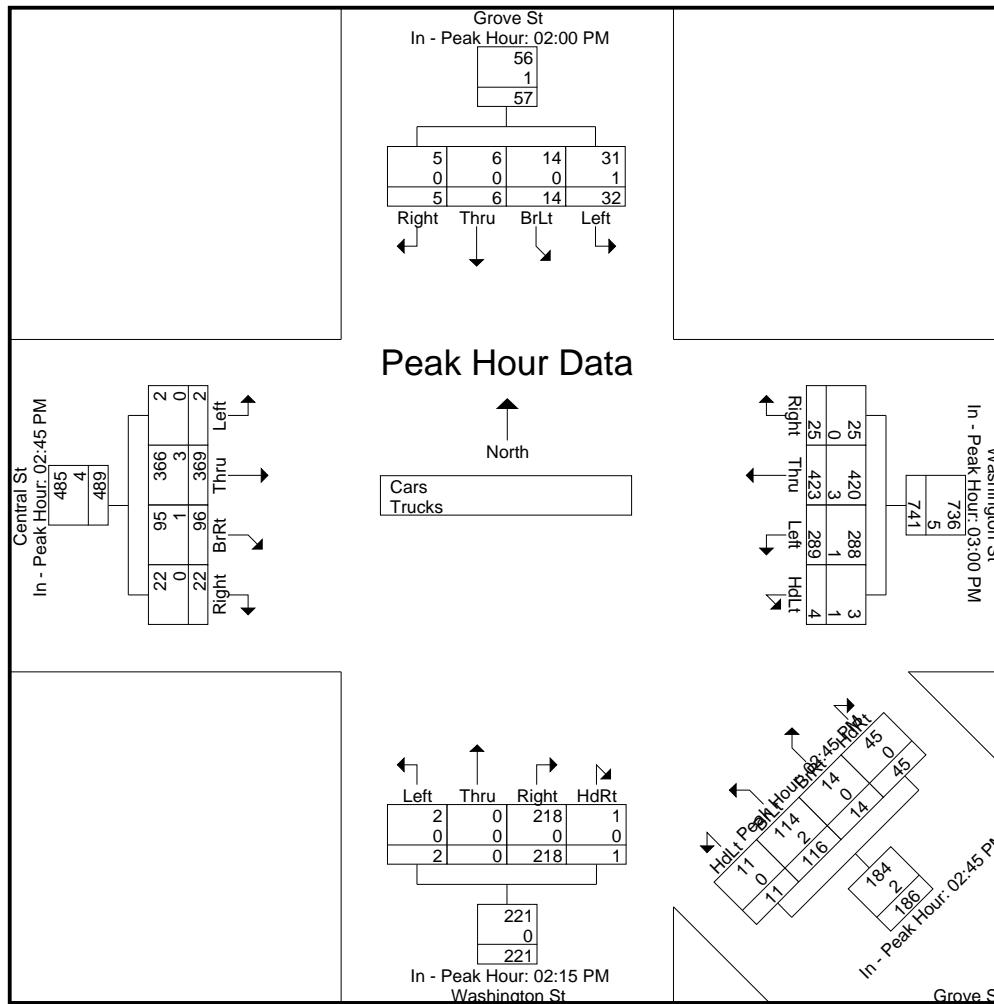
Peak Hour for Each Approach Begins at:

	02:00 PM					03:00 PM					02:45 PM					02:15 PM					02:45 PM				
+0 mins.	11	4	2	1	18	0	68	113	6	187	3	27	3	9	42	0	0	58	0	58	1	91	17	5	114
+15 mins.	11	4	0	2	17	0	69	99	4	172	4	21	3	14	42	2	0	57	1	60	1	92	27	5	125
+30 mins.	5	3	3	1	12	0	79	89	8	176	3	36	4	11	54	0	0	48	0	48	0	96	27	9	132
+45 mins.	5	3	1	1	10	4	73	122	7	206	1	32	4	11	48	0	0	55	0	55	0	90	25	3	118
Total Volume	32	14	6	5	57	4	289	423	25	741	11	116	14	45	186	2	0	218	1	221	2	369	96	22	489
% App. Total	56.1	24.6	10.5	8.8		0.5	39	57.1	3.4		5.9	62.4	7.5	24.2		0.9	0	98.6	0.5		0.4	75.5	19.6	4.5	

# Accurate Counts

978-664-2565

PHF	.727	.875	.500	.625	.792	.250	.915	.867	.781	.899	.688	.806	.875	.804	.861	.250	.000	.940	.250	.921	.500	.961	.889	.611	.926
Cars	31	14	6	5	56	3	288	420	25	736	11	114	14	45	184	2	0	218	1	221	2	366	95	22	485
% Cars	96.9	100	100	100	98.2	75	99.7	99.3	100	99.3	100	98.3	100	100	98.9	100	0	100	100	100	100	99.2	99	100	99.2
Trucks	1	0	0	0	1	1	1	3	0	5	0	2	0	0	2	0	0	0	0	0	0	3	1	0	4
% Trucks	3.1	0	0	0	1.8	25	0.3	0.7	0	0.7	0	1.7	0	0	1.1	0	0	0	0	0	0	0.8	1	0	0.8



# Accurate Counts

978-664-2565

N/S Street : Grove St / Washington St  
 E/W Street : Washington St / Central St  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0001  
 Site Code : 54700001  
 Start Date : 9/25/2018  
 Page No : 5

## Groups Printed- Cars

	Grove St From North				Washington St From East				Grove St From Southeast				Washington St From South				Central St From West					
	Start Time	Left	BrLt	Thru	Right	HdLt	Left	Thru	Right	HdLt	BrLt	BrRt	HdRt	Left	Thru	Right	HdRt	Left	Thru	BrRt	Right	
02:00 PM		11	4	2	1	3	57	81	7	3	22	6	12	0	0	41	0	0	68	25	9	352
02:15 PM		10	4	0	2	3	58	67	3	3	20	4	11	0	0	58	0	0	85	13	9	350
02:30 PM		5	3	3	1	1	58	119	2	0	21	2	8	2	0	57	1	0	79	28	9	399
02:45 PM		5	3	1	1	2	64	89	5	3	26	3	9	0	0	48	0	1	90	17	5	372
Total		31	14	6	5	9	237	356	17	9	89	15	40	2	0	204	1	1	322	83	32	1473
03:00 PM		8	2	1	2	0	68	112	6	4	21	3	14	0	0	55	0	1	91	26	5	419
03:15 PM		7	2	4	1	0	69	98	4	3	35	4	11	0	0	52	0	0	96	27	9	422
03:30 PM		9	3	4	1	0	78	88	8	1	32	4	11	0	0	39	0	0	89	25	3	395
03:45 PM		4	2	5	1	3	73	122	7	2	32	4	3	0	0	55	0	0	76	27	11	427
Total		28	9	14	5	3	288	420	25	10	120	15	39	0	0	201	0	1	352	105	28	1663
Grand Total		59	23	20	10	12	525	776	42	19	209	30	79	2	0	405	1	2	674	188	60	3136
Apprch %		52.7	20.5	17.9	8.9	0.9	38.7	57.3	3.1	5.6	62	8.9	23.4	0.5	0	99.3	0.2	0.2	72.9	20.3	6.5	
Total %		1.9	0.7	0.6	0.3	0.4	16.7	24.7	1.3	0.6	6.7	1	2.5	0.1	0	12.9	0	0.1	21.5	6	1.9	

**Accurate Counts**

978-664-2565

N/S Street : Grove St / Washington St  
 E/W Street : Washington St / Central St  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0001  
 Site Code : 54700001  
 Start Date : 9/25/2018  
 Page No : 6

	Grove St					Washington St					Grove St					Washington St					Central St					
	From North					From East					From Southeast					From South					From West					
Start Time	Left	BrLt	Thru	Right	App. Total	HdLt	Left	Thru	Right	App. Total	HdLt	BrLt	BrRt	HdRt	App. Total	Left	Thru	Right	HdRt	App. Total	Left	Thru	BrRt	Right	App. Total	Int. Total

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 03:00 PM

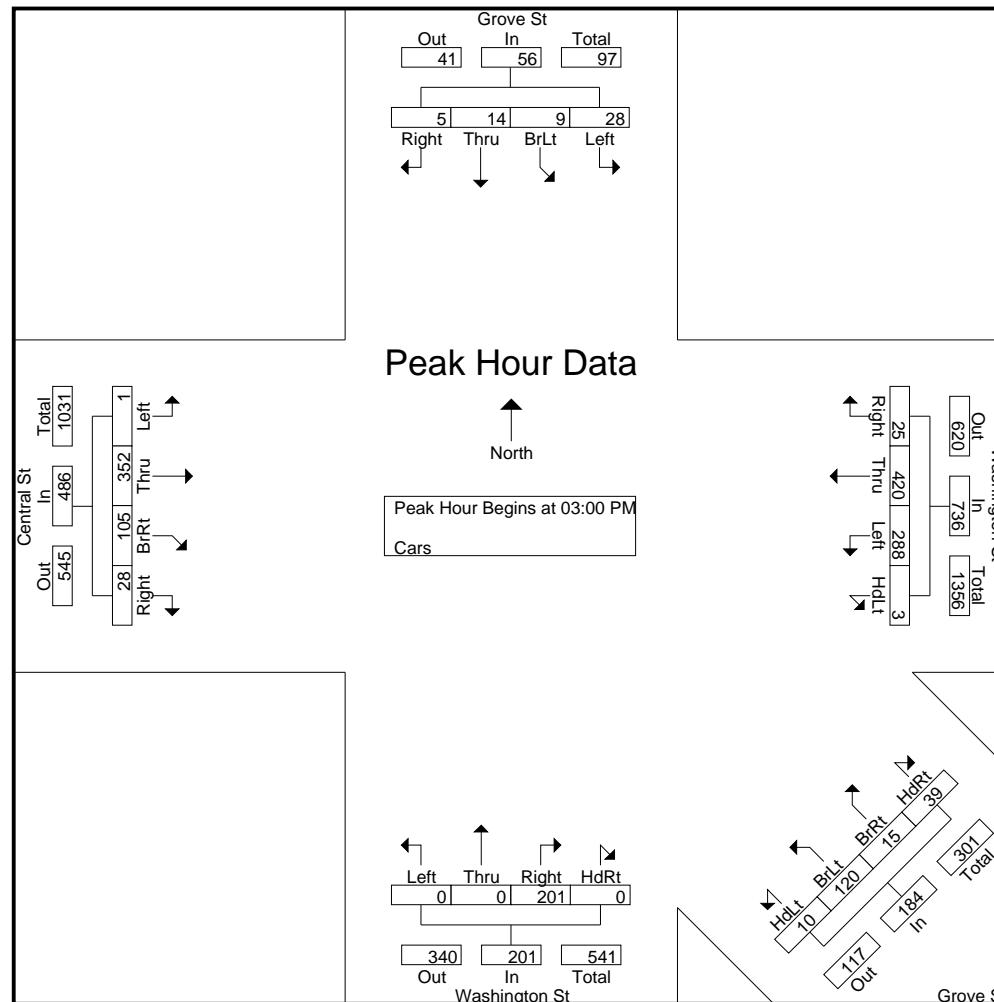
03:00 PM	8	2	1	<b>2</b>	13	0	68	112	6	186	<b>4</b>	21	3	<b>14</b>	42	0	0	<b>55</b>	0	<b>55</b>	<b>1</b>	91	26	5	123	419
03:15 PM	7	2	4	1	14	0	69	98	4	171	3	<b>35</b>	4	11	<b>53</b>	0	0	52	0	52	0	<b>96</b>	<b>27</b>	9	<b>132</b>	422
03:30 PM	<b>9</b>	<b>3</b>	4	1	<b>17</b>	0	<b>78</b>	88	<b>8</b>	174	1	32	4	11	48	0	0	39	0	39	0	89	25	3	117	395
03:45 PM	4	2	<b>5</b>	1	12	<b>3</b>	73	<b>122</b>	7	<b>205</b>	2	32	4	3	41	0	0	55	0	55	0	76	27	<b>11</b>	114	<b>427</b>
Total Volume	28	9	14	5	56	3	288	420	25	736	10	120	15	39	184	0	0	201	0	201	1	352	105	28	486	1663
% App. Total	50	16.1	25	8.9		0.4	39.1	57.1	3.4		5.4	65.2	8.2	21.2		0	0	100	0		0.2	72.4	21.6	5.8		
PHF	.778	.750	.700	.625	.824	.250	.923	.861	.781	.898	.625	.857	.938	.696	.868	.000	.000	.914	.000	.914	.250	.917	.972	.636	.920	.974

# Accurate Counts

978-664-2565

N/S Street : Grove St / Washington St  
 E/W Street : Washington St / Central St  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0001  
 Site Code : 54700001  
 Start Date : 9/25/2018  
 Page No : 7



Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

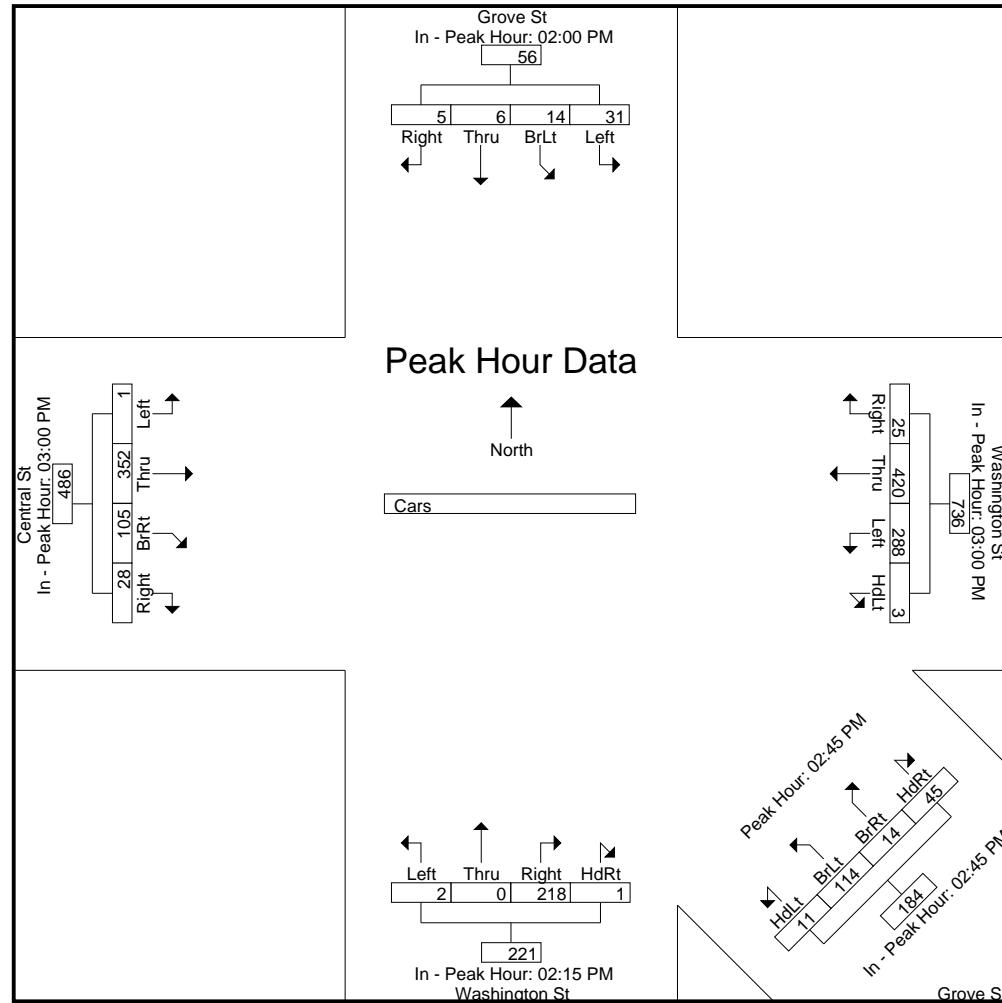
Peak Hour for Each Approach Begins at:

	02:00 PM				03:00 PM					02:45 PM					02:15 PM					03:00 PM					
+0 mins.	11	4	2	1	18	0	68	112	6	186	3	26	3	9	41	0	0	58	0	58	1	91	26	5	123
+15 mins.	10	4	0	2	16	0	69	98	4	171	4	21	3	14	42	2	0	57	1	60	0	96	27	9	132
+30 mins.	5	3	3	1	12	0	78	88	8	174	3	35	4	11	53	0	0	48	0	48	0	89	25	3	117
+45 mins.	5	3	1	1	10	3	73	122	7	205	1	32	4	11	48	0	0	55	0	55	0	76	27	11	114
Total Volume	31	14	6	5	56	3	288	420	25	736	11	114	14	45	184	2	0	218	1	221	1	352	105	28	486
% App. Total	55.4	25	10.7	8.9		0.4	39.1	57.1	3.4		6	62	7.6	24.5		0.9	0	98.6	0.5		0.2	72.4	21.6	5.8	

# Accurate Counts

978-664-2565

PHF	.705	.875	.500	.625	.778	.250	.923	.861	.781	.898	.688	.814	.875	.804	.868	.250	.000	.940	.250	.921	.250	.917	.972	.636	.920
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# Accurate Counts

978-664-2565

N/S Street : Grove St / Washington St  
 E/W Street : Washington St / Central St  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0001  
 Site Code : 54700001  
 Start Date : 9/25/2018  
 Page No : 9

## Groups Printed- Trucks

	Grove St From North				Washington St From East				Grove St From Southeast				Washington St From South				Central St From West						
	Start Time	Left	BrLt	Thru	Right	HdLt	Left	Thru	Right	HdLt	BrLt	BrRt	HdRt	Left	Thru	Right	HdRt	Left	Thru	BrRt	Right		
02:00 PM		0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	0	0	3	0	0	6	
02:15 PM		1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	4	
02:30 PM		0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	
02:45 PM		0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	1	0	0	4	
Total		1	0	0	0	0	0	1	4	1	0	2	0	0	0	0	1	0	0	5	1	0	16
03:00 PM		1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	4	
03:15 PM		0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2
03:30 PM		0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	3
03:45 PM		0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total		1	0	0	0	1	1	3	0	0	1	0	0	0	0	0	0	0	2	1	0	10	
Grand Total		2	0	0	0	1	2	7	1	0	3	0	0	0	0	0	1	0	0	7	2	0	26
Apprch %		100	0	0	0	9.1	18.2	63.6	9.1	0	100	0	0	0	0	100	0	0	77.8	22.2	0		
Total %		7.7	0	0	0	3.8	7.7	26.9	3.8	0	11.5	0	0	0	0	3.8	0	0	26.9	7.7	0		

**Accurate Counts**

978-664-2565

N/S Street : Grove St / Washington St  
 E/W Street : Washington St / Central St  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0001  
 Site Code : 54700001  
 Start Date : 9/25/2018  
 Page No : 10

	Grove St					Washington St					Grove St					Washington St					Central St					
	From North					From East					From Southeast					From South					From West					
Start Time	Left	BrLt	Thru	Right	App. Total	HdLt	Left	Thru	Right	App. Total	HdLt	BrLt	BrRt	HdRt	App. Total	Left	Thru	Right	HdRt	App. Total	Left	Thru	BrRt	Right	App. Total	Int. Total

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 02:00 PM

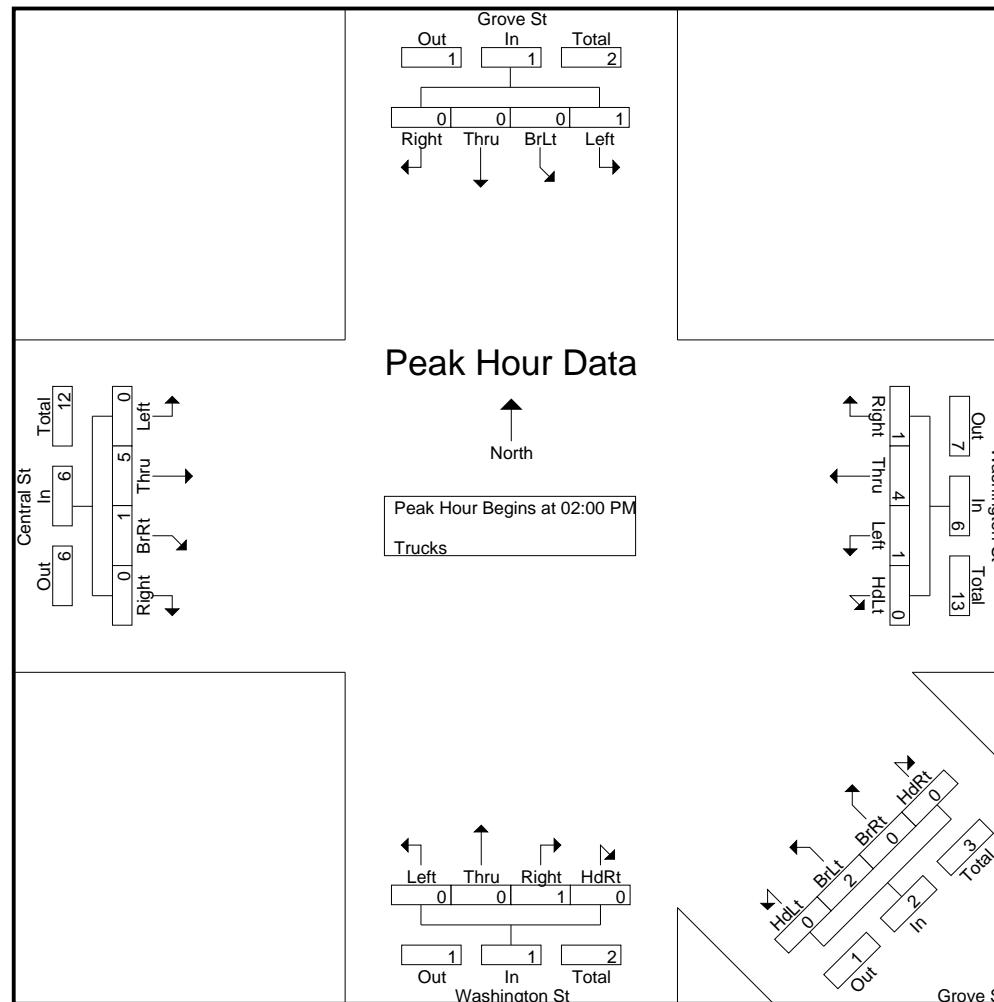
02:00 PM	0	0	0	0	0	0	0	1	0	1	0	1	0	0	1	0	0	1	0	1	0	3	0	0	3	6
02:15 PM	1	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	4
02:30 PM	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
02:45 PM	0	0	0	0	0	0	1	0	1	2	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	4
Total Volume	1	0	0	0	1	0	1	4	1	6	0	2	0	0	2	0	0	1	0	1	0	5	1	0	6	16
% App. Total	100	0	0	0		0	16.7	66.7	16.7		0	100	0	0		0	0	100	0		0	83.3	16.7	0		
PHF	.250	.000	.000	.000	.250	.000	.250	.500	.250	.750	.000	.500	.000	.000	.500	.000	.000	.250	.000	.250	.000	.417	.250	.000	.500	.667

# Accurate Counts

978-664-2565

N/S Street : Grove St / Washington St  
 E/W Street : Washington St / Central St  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0001  
 Site Code : 54700001  
 Start Date : 9/25/2018  
 Page No : 11



Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

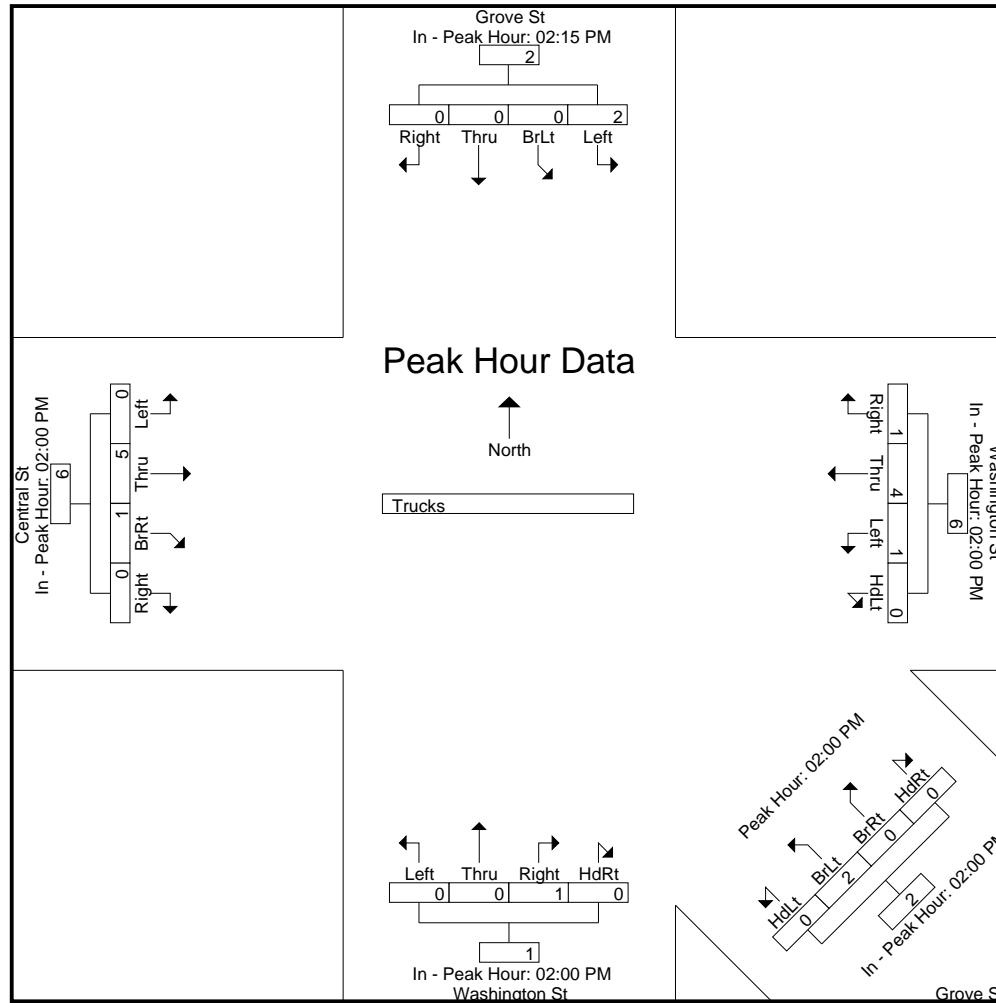
Peak Hour for Each Approach Begins at:

	02:15 PM	02:00 PM	02:00 PM	02:00 PM	02:00 PM
+0 mins.	1 0 0 0 1	0 0 1 0 1	0 1 0 0 1	0 0 1 0 0	0 0 1 0 1
+15 mins.	0 0 0 0 0	0 0 1 0 1	0 0 0 0 0	0 0 0 0 0	0 0 1 0 0
+30 mins.	0 0 0 0 0	0 0 2 0 2	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0
+45 mins.	1 0 0 0 1	0 1 0 1 2	0 1 0 0 1	0 0 0 0 0	0 1 0 0 1
Total Volume	2 0 0 0 2	0 1 4 1 6	0 2 0 0 2	0 0 1 0 1	0 5 1 0 6
% App. Total	100 0 0 0	0 16.7 66.7 16.7	0 100 0 0	0 100 0	0 83.3 16.7 0

# Accurate Counts

978-664-2565

PHF	.500	.000	.000	.000	.500	.000	.250	.500	.250	.750	.000	.500	.000	.000	.500	.000	.000	.250	.000	.250	.000	.250	.000	.417	.250	.000	.500
-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------



# Accurate Counts

978-664-2565

N/S Street : Grove St / Washington St  
 E/W Street : Washington St / Central St  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0001  
 Site Code : 54700001  
 Start Date : 9/25/2018  
 Page No : 13

## Groups Printed- Bikes Peds

	Grove St From North					Washington St From East					Grove St From Southeast					Washington St From South					Central St From West					Exclu. Total	Inclu. Total	Int. Total		
	Start Time	Left	BrLt	Thru	Right	Peds	HdLt	Left	Thru	Right	Peds	HdLt	BrLt	BrRt	HdRt	Peds	Left	Thru	Right	HdRt	Peds	Left	Thru	BrRt	Right	Peds				
02:00 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	3	0	0	0	0	2	9	0	9	
02:15 PM	0	0	0	0	0	2	0	0	0	0	10	0	0	0	0	0	0	0	0	0	3	0	0	0	0	4	19	0	19	
02:30 PM	0	0	0	0	0	0	0	0	2	0	3	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	4	2	6	
02:45 PM	0	0	0	0	0	4	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	8	2	10	
Total		0	0	0	0	6	0	0	2	0	21	0	0	0	0	0	0	0	0	0	7	0	1	0	1	6	40	4	44	
03:00 PM	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	3
03:15 PM	0	0	1	0	0	3	0	0	0	0	4	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	19	1	20	
03:30 PM	0	0	0	0	0	3	0	0	0	0	4	0	0	0	0	0	0	0	0	0	10	0	0	0	0	4	21	0	21	
03:45 PM	0	0	0	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	11	0	0	0	0	1	15	0	15	
Total		0	0	1	0	8	0	0	0	0	11	0	0	0	0	0	0	0	0	0	33	0	0	0	0	6	58	1	59	
Grand Total		0	0	1	0	14	0	0	2	0	32	0	0	0	0	0	0	0	0	0	40	0	1	0	1	12	98	5	103	
Apprch %		0	0	100	0		0	0	100	0		0	0	0	0	0	0	0	0	0	0	0	50	0	50					
Total %		0	0	20	0		0	0	40	0		0	0	0	0	0	0	0	0	0	0	0	20	0	20		95.1	4.9		

# Accurate Counts

978-664-2565

N/S Street : Grove St / Washington St  
 E/W Street : Washington St / Central St  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0001  
 Site Code : 54700001  
 Start Date : 9/25/2018  
 Page No : 14

	Grove St					Washington St					Grove St					Washington St					Central St					
	From North					From East					From Southeast					From South					From West					
Start Time	Left	BrLt	Thru	Right	App. Total	HdLt	Left	Thru	Right	App. Total	HdLt	BrLt	BrRt	HdRt	App. Total	Left	Thru	Right	HdRt	App. Total	Left	Thru	BrRt	Right	App. Total	Int. Total

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 02:30 PM

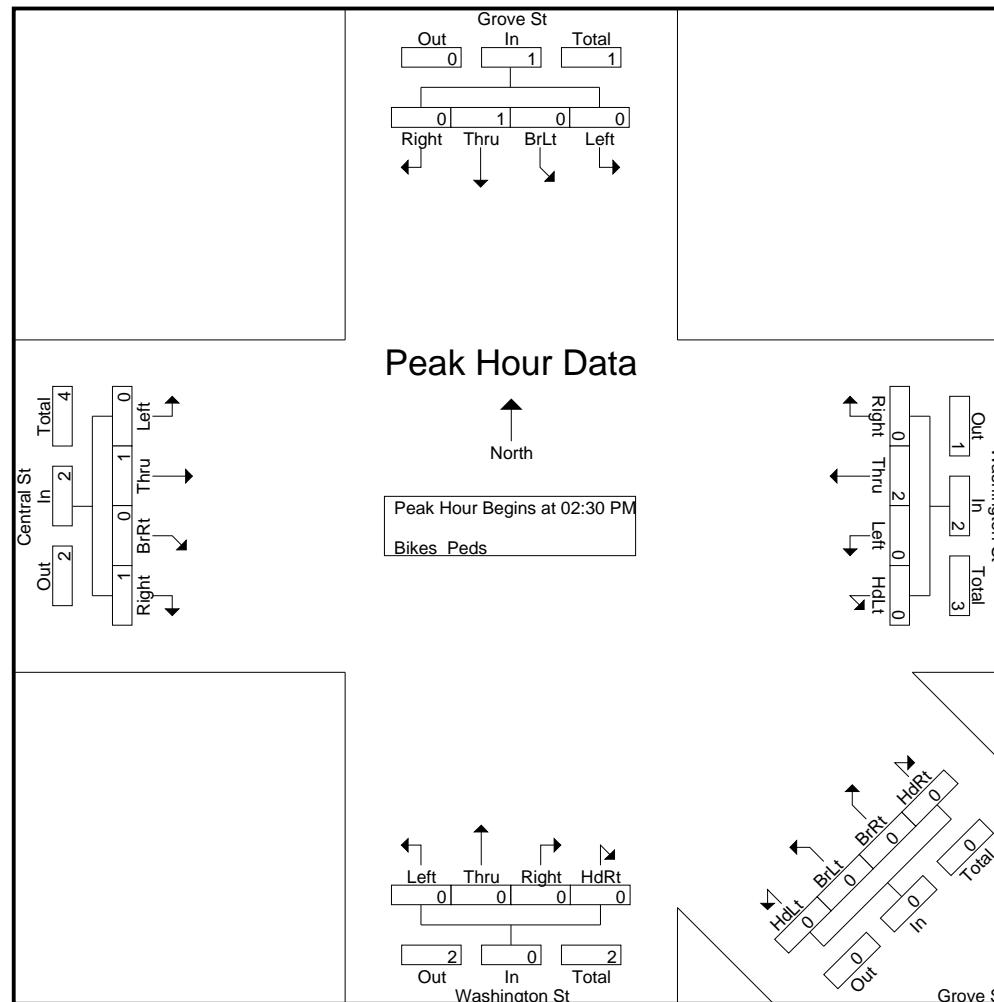
02:30 PM	0	0	0	0	0	0	0	<b>2</b>	0	<b>2</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	<b>2</b>	
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	<b>1</b>	0	0	<b>1</b>	<b>2</b>	2
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	<b>1</b>	0	<b>1</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Total Volume	0	0	1	0	1	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	5	
% App. Total	0	0	100	0		0	0	100	0		0	0	0	0	0	0	0	0	0	0	0	50	0	50			
PHF	.000	.000	.250	.000	.250	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.250	.625	

# Accurate Counts

978-664-2565

N/S Street : Grove St / Washington St  
 E/W Street : Washington St / Central St  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0001  
 Site Code : 54700001  
 Start Date : 9/25/2018  
 Page No : 15



Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

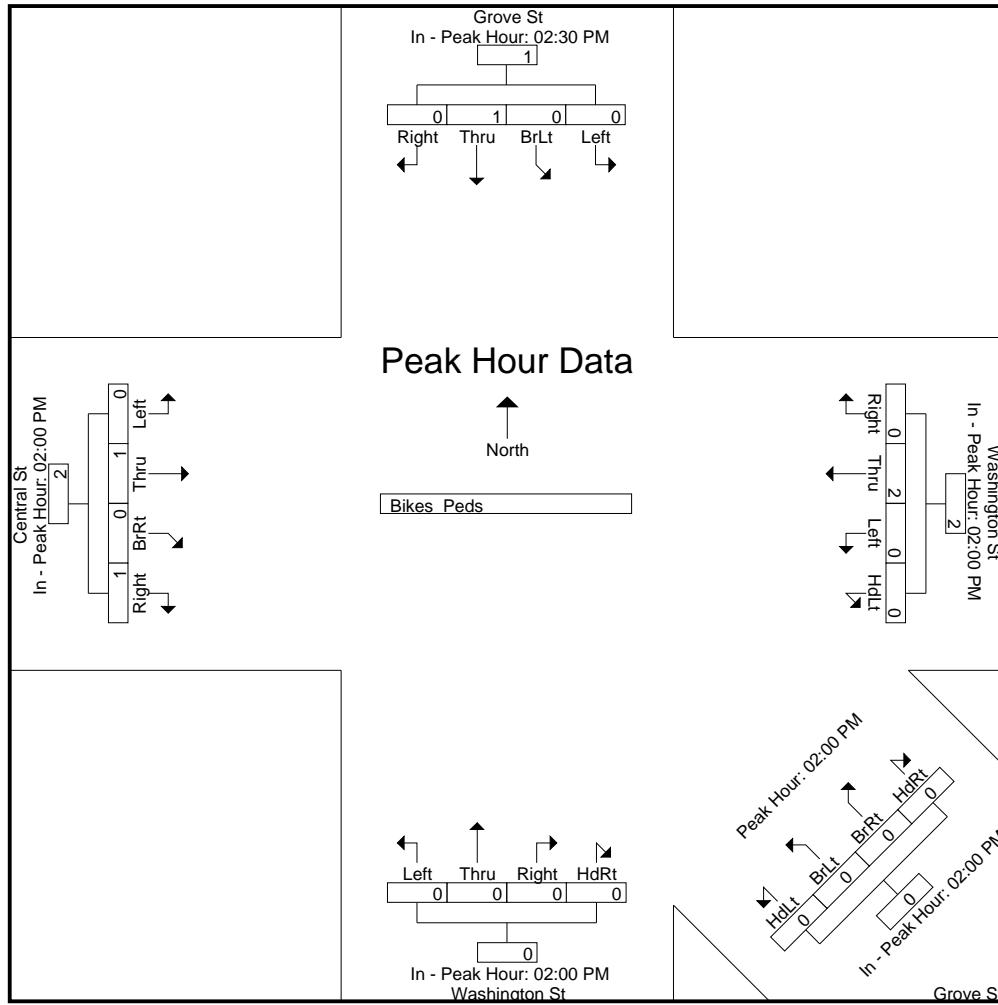
Peak Hour for Each Approach Begins at:

	02:30 PM					02:00 PM					02:00 PM					02:00 PM					02:00 PM					
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	2
<b>Total Volume</b>	0	0	1	0	1	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	1	0	1	1	2	
<b>% App. Total</b>	0	0	100	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	50	0	50	0	50	

## Accurate Counts

978-664-2565

PHF | .000 .000 .250 .000 .250 | .000 .000 .250 .000 .250 | .000 .000 .000 .000 .000 | .000 .000 .000 .000 .000 | .000 .000 .000 .000 .000 | .000 .250 .000 .250 .250 |



**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

File Name : 547J00R2  
 Site Code : 547J0002  
 Start Date : 10/4/2018  
 Page No : 1

Groups Printed- Cars - Trucks

	Washington St From East		Cameron St From South		Washington St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	9	81	0	5	319	3	417
07:15 AM	4	123	0	5	313	8	453
07:30 AM	10	124	1	4	307	8	454
07:45 AM	8	159	0	10	311	6	494
Total	31	487	1	24	1250	25	1818
08:00 AM	3	156	0	7	280	6	452
08:15 AM	8	167	1	34	343	5	558
08:30 AM	8	176	0	22	256	5	467
08:45 AM	12	168	0	13	265	8	466
Total	31	667	1	76	1144	24	1943
Grand Total	62	1154	2	100	2394	49	3761
Apprch %	5.1	94.9	2	98	98	2	
Total %	1.6	30.7	0.1	2.7	63.7	1.3	
Cars	61	1140	2	99	2372	49	3723
% Cars	98.4	98.8	100	99	99.1	100	99
Trucks	1	14	0	1	22	0	38
% Trucks	1.6	1.2	0	1	0.9	0	1

**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

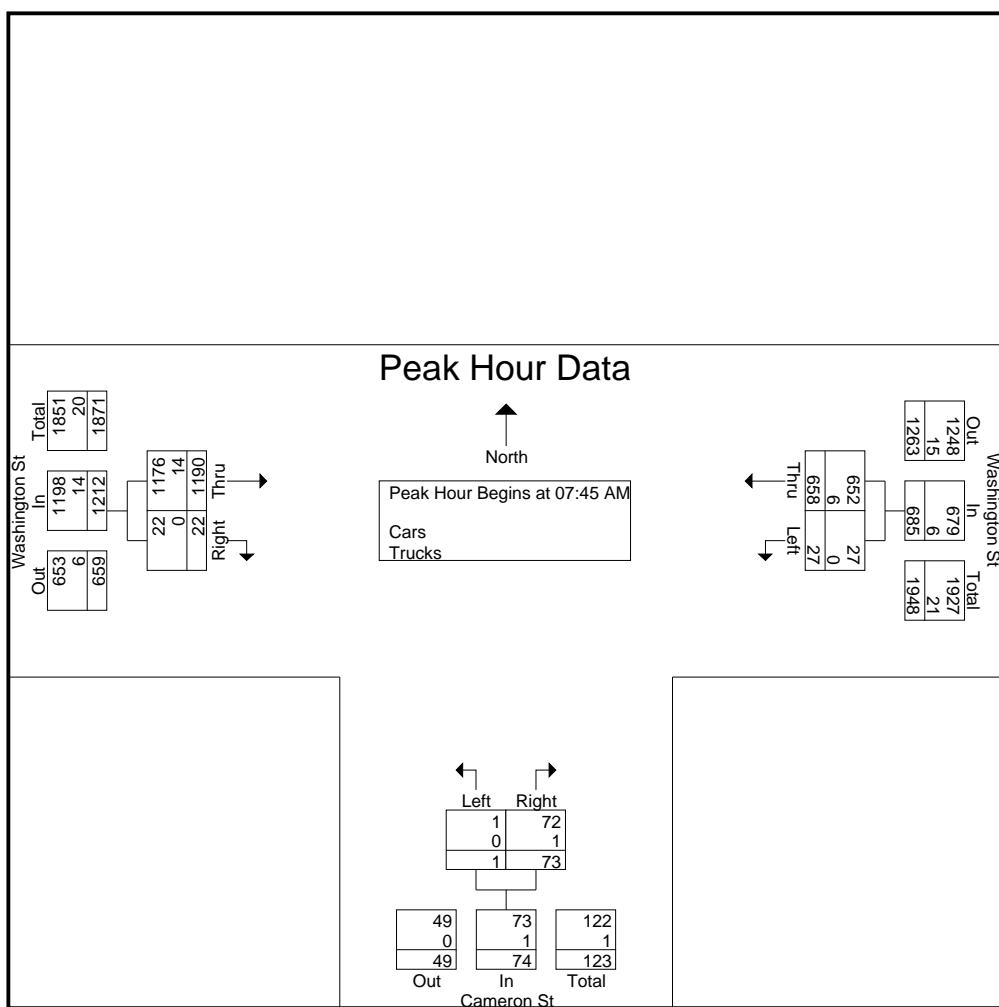
File Name : 547J00R2  
 Site Code : 547J0002  
 Start Date : 10/4/2018  
 Page No : 2

	Washington St			Cameron St			Washington St			
	From East			From South			From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:45 AM

07:45 AM	<b>8</b>	159	167	0	10	10	311	<b>6</b>	317	494
08:00 AM	3	156	159	0	7	7	280	6	286	452
08:15 AM	8	167	175	1	<b>34</b>	<b>35</b>	<b>343</b>	5	<b>348</b>	<b>558</b>
08:30 AM	8	<b>176</b>	<b>184</b>	0	22	22	256	5	261	467
Total Volume	27	658	685	1	73	74	1190	22	1212	1971
% App. Total	3.9	96.1		1.4	98.6		98.2	1.8		
PHF	.844	.935	.931	.250	.537	.529	.867	.917	.871	.883
Cars	27	652	679	1	72	73	1176	22	1198	1950
% Cars	100	99.1	99.1	100	98.6	98.6	98.8	100	98.8	98.9
Trucks	0	6	6	0	1	1	14	0	14	21
% Trucks	0	0.9	0.9	0	1.4	1.4	1.2	0	1.2	1.1



**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

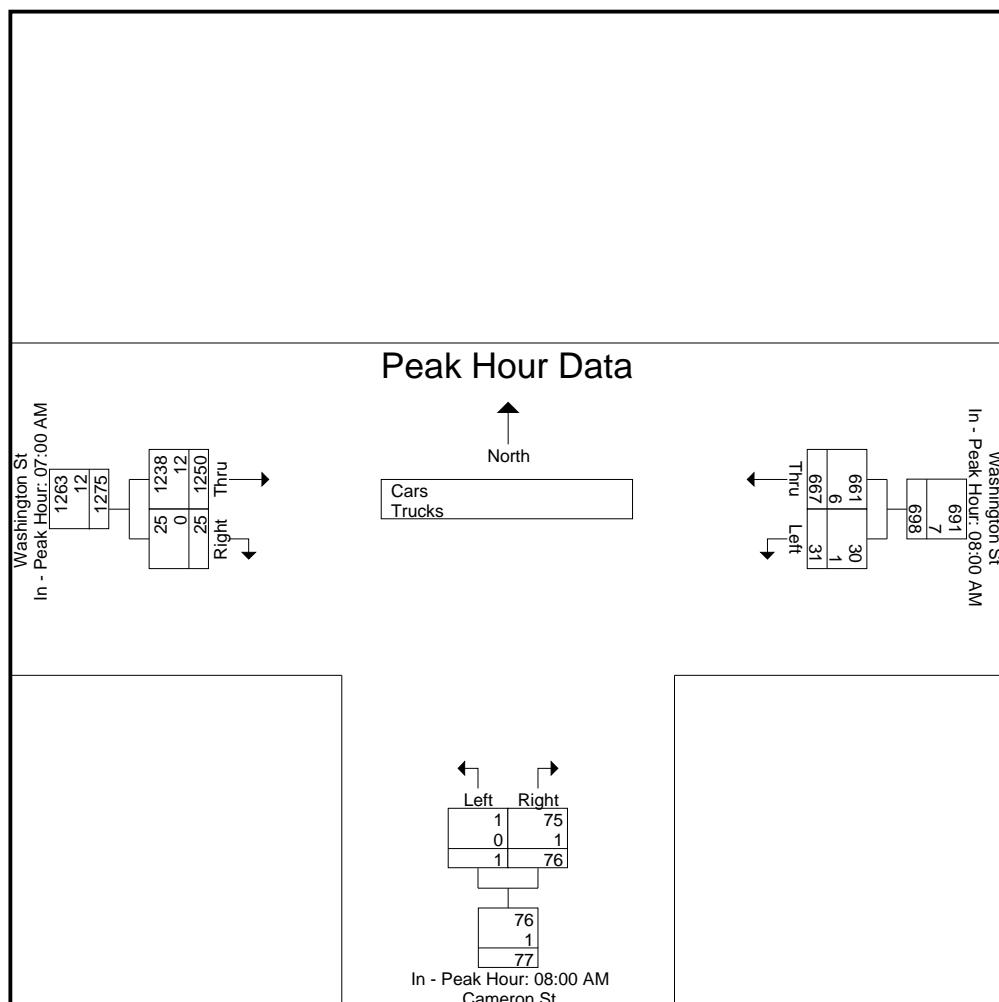
File Name : 547J00R2  
 Site Code : 547J0002  
 Start Date : 10/4/2018  
 Page No : 3

	Washington St From East			Cameron St From South			Washington St From West			Int. Total
	Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:00 AM	08:00 AM			07:00 AM		
+0 mins.	3 156 159	0	7	7	<b>319</b>	3	<b>322</b>
+15 mins.	8 167 175	1	<b>34</b>	<b>35</b>	313	8	321
+30 mins.	8 <b>176</b> <b>184</b>	0	22	22	307	8	315
+45 mins.	<b>12</b> 168 180	0	13	13	311	6	317
Total Volume	31 667 698	1	76	77	1250	25	1275
% App. Total	4.4 95.6	1.3	98.7		98	2	
PHF	.646 .947 .948	.250	.559	.550	.980	.781	.990
Cars	30 661 691	1	75	76	1238	25	1263
% Cars	96.8 99.1 99	100	98.7	98.7	99	100	99.1
Trucks	1 6 7	0	1	1	12	0	12
% Trucks	3.2 0.9 1	0	1.3	1.3	1	0	0.9



**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

File Name : 547J00R2  
 Site Code : 547J0002  
 Start Date : 10/4/2018  
 Page No : 4

Groups Printed- Cars

	Washington St From East		Cameron St From South		Washington St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	9	77	0	5	318	3	412
07:15 AM	4	121	0	5	313	8	451
07:30 AM	10	122	1	4	302	8	447
07:45 AM	8	159	0	10	305	6	488
Total	31	479	1	24	1238	25	1798
08:00 AM	3	154	0	7	277	6	447
08:15 AM	8	166	1	33	343	5	556
08:30 AM	8	173	0	22	251	5	459
08:45 AM	11	168	0	13	263	8	463
Total	30	661	1	75	1134	24	1925
Grand Total	61	1140	2	99	2372	49	3723
Apprch %	5.1	94.9	2	98	98	2	
Total %	1.6	30.6	0.1	2.7	63.7	1.3	

**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

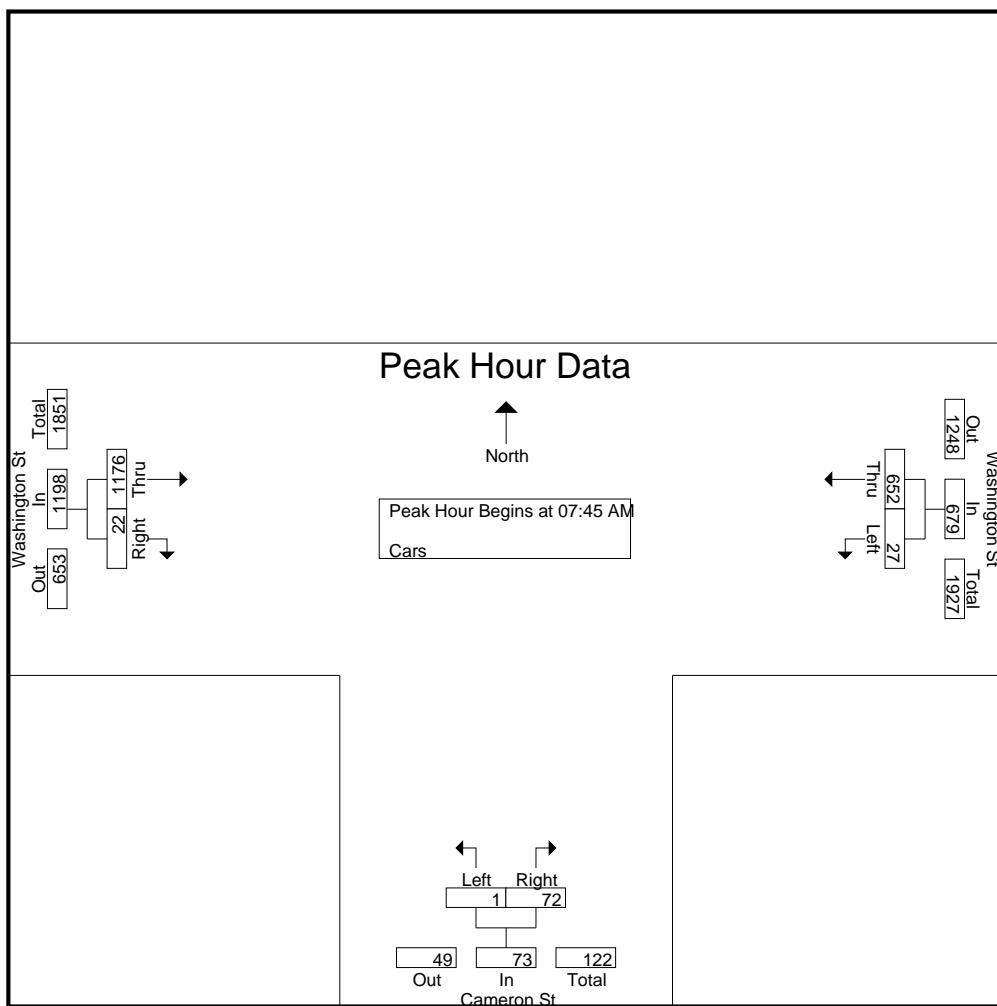
File Name : 547J00R2  
 Site Code : 547J0002  
 Start Date : 10/4/2018  
 Page No : 5

	Washington St			Cameron St			Washington St			
	From East			From South			From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:45 AM

07:45 AM	<b>8</b>	159	167	0	10	10	305	<b>6</b>	311	488
08:00 AM	3	154	157	0	7	7	277	6	283	447
08:15 AM	8	166	174	1	<b>33</b>	<b>34</b>	<b>343</b>	5	<b>348</b>	<b>556</b>
08:30 AM	8	<b>173</b>	<b>181</b>	0	22	22	251	5	256	459
Total Volume	27	652	679	1	72	73	1176	22	1198	1950
% App. Total	4	96		1.4	98.6		98.2	1.8		
PHF	.844	.942	.938	.250	.545	.537	.857	.917	.861	.877



**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

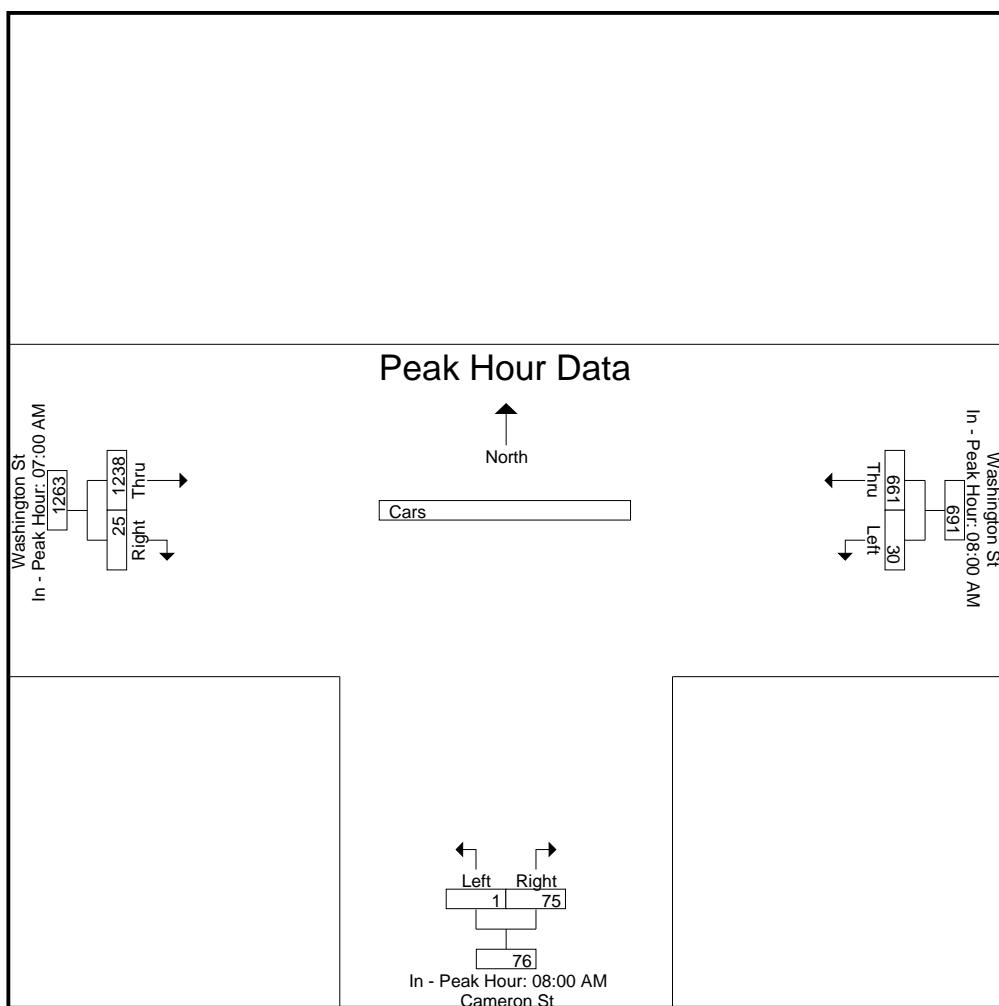
File Name : 547J00R2  
 Site Code : 547J0002  
 Start Date : 10/4/2018  
 Page No : 6

	Washington St From East			Cameron St From South			Washington St From West			Int. Total
	Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:00 AM	08:00 AM	07:00 AM
+0 mins.	3 154 157	0 7 7	<b>318</b> 3 <b>321</b>
+15 mins.	8 166 174	1 <b>33</b> <b>34</b>	313 <b>8</b> 321
+30 mins.	8 <b>173</b> <b>181</b>	0 22 22	302 <b>8</b> 310
+45 mins.	<b>11</b> 168 179	0 13 13	305 6 311
Total Volume	30 661 691	1 75 76	1238 25 1263
% App. Total	4.3 95.7	1.3 98.7	98 2
PHF	.682 .955 .954	.250 .568 .559	.973 .781 .984



**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

File Name : 547J00R2  
 Site Code : 547J0002  
 Start Date : 10/4/2018  
 Page No : 7

Groups Printed- Trucks

	Washington St From East		Cameron St From South		Washington St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	0	4	0	0	1	0	5
07:15 AM	0	2	0	0	0	0	2
07:30 AM	0	2	0	0	5	0	7
07:45 AM	0	0	0	0	6	0	6
Total	0	8	0	0	12	0	20
08:00 AM	0	2	0	0	3	0	5
08:15 AM	0	1	0	1	0	0	2
08:30 AM	0	3	0	0	5	0	8
08:45 AM	1	0	0	0	2	0	3
Total	1	6	0	1	10	0	18
Grand Total	1	14	0	1	22	0	38
Apprch %	6.7	93.3	0	100	100	0	
Total %	2.6	36.8	0	2.6	57.9	0	

**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

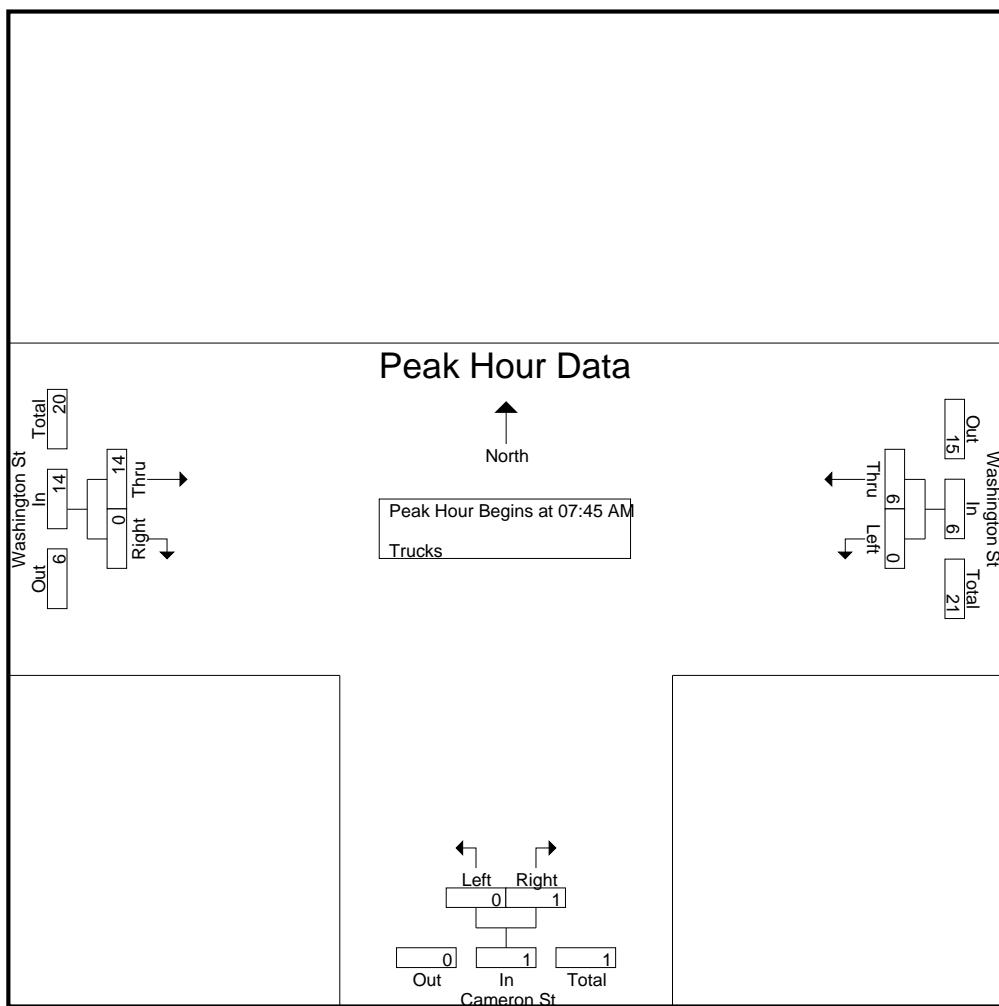
File Name : 547J00R2  
 Site Code : 547J0002  
 Start Date : 10/4/2018  
 Page No : 8

	Washington St			Cameron St			Washington St			
	From East			From South			From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:45 AM

07:45 AM	0	0	0	0	0	0	<b>6</b>	0	<b>6</b>	6
08:00 AM	0	2	2	0	0	0	3	0	3	5
08:15 AM	0	1	1	0	<b>1</b>	<b>1</b>	0	0	0	2
08:30 AM	0	<b>3</b>	<b>3</b>	0	0	0	5	0	5	<b>8</b>
Total Volume	0	6	6	0	1	1	14	0	14	21
% App. Total	0	100		0	100		100	0		
PHF	.000	.500	.500	.000	.250	.250	.583	.000	.583	.656



**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

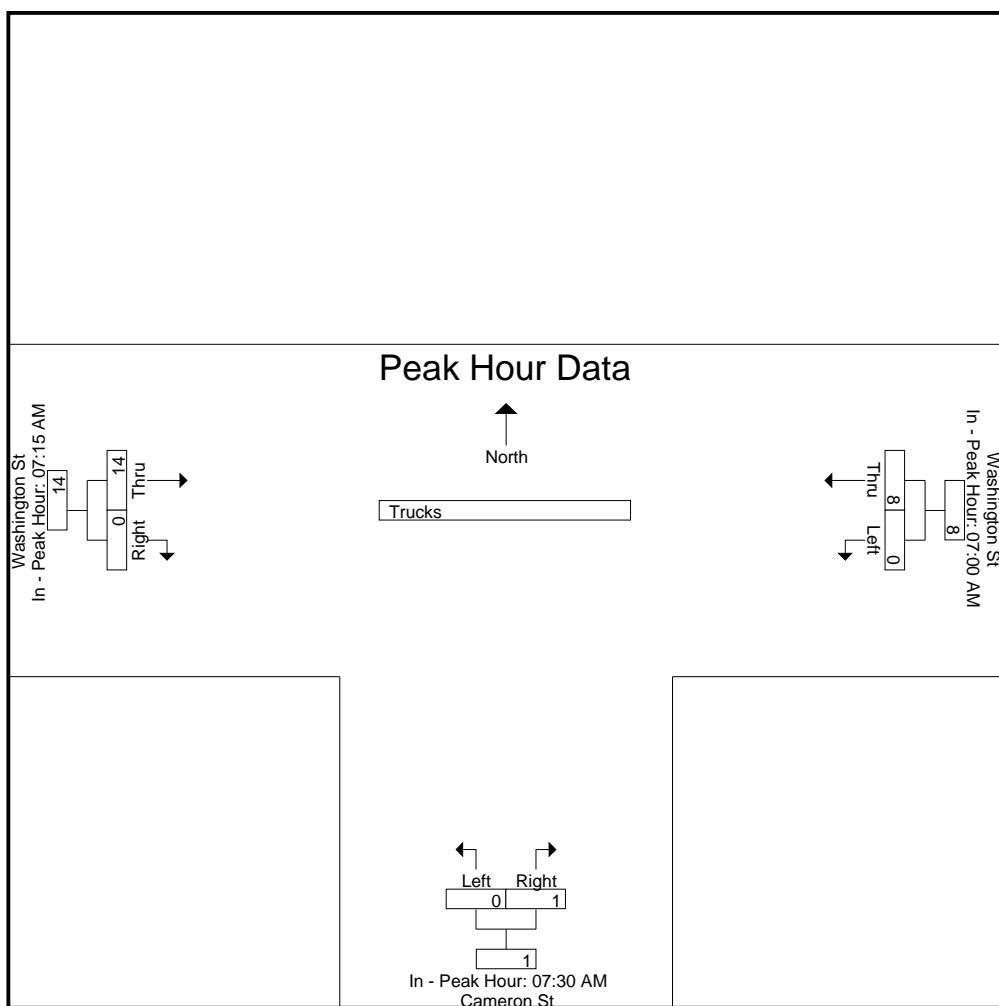
File Name : 547J00R2  
 Site Code : 547J0002  
 Start Date : 10/4/2018  
 Page No : 9

	Washington St From East			Cameron St From South			Washington St From West			Int. Total
	Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM		07:30 AM		07:15 AM	
+0 mins.	0	4	4	0	0	0
+15 mins.	0	2	2	0	0	0
+30 mins.	0	2	2	0	0	0
+45 mins.	0	0	0	0	1	1
Total Volume	0	8	8	0	1	1
% App. Total	0	100		0	100	
PHF	.000	.500	.500	.000	.250	.250
					.583	.000
						.583



**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

File Name : 547J00R2  
 Site Code : 547J0002  
 Start Date : 10/4/2018  
 Page No : 10

Groups Printed- Bikes Peds

	Washington St From East			Cameron St From South			Washington St From West						
	Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Excl. Total	Incl. Total	Int. Total
07:00 AM		1	1	0	0	0	0	1	0	0	0	3	3
07:15 AM		0	0	0	0	0	6	3	0	1	7	3	10
07:30 AM		0	0	0	0	0	0	3	0	2	2	3	5
07:45 AM		0	2	2	0	0	2	4	0	4	8	6	14
Total		1	3	2	0	0	8	11	0	7	17	15	32
08:00 AM		0	1	0	0	0	2	0	0	2	4	1	5
08:15 AM		0	0	0	0	1	4	0	0	8	12	1	13
08:30 AM		0	1	0	0	0	6	1	0	4	10	2	12
08:45 AM		0	1	0	0	0	7	0	0	3	10	1	11
Total		0	3	0	0	1	19	1	0	17	36	5	41
Grand Total		1	6	2	0	1	27	12	0	24	53	20	73
Apprch %		14.3	85.7		0	100		100	0				
Total %		5	30		0	5		60	0		72.6	27.4	

**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

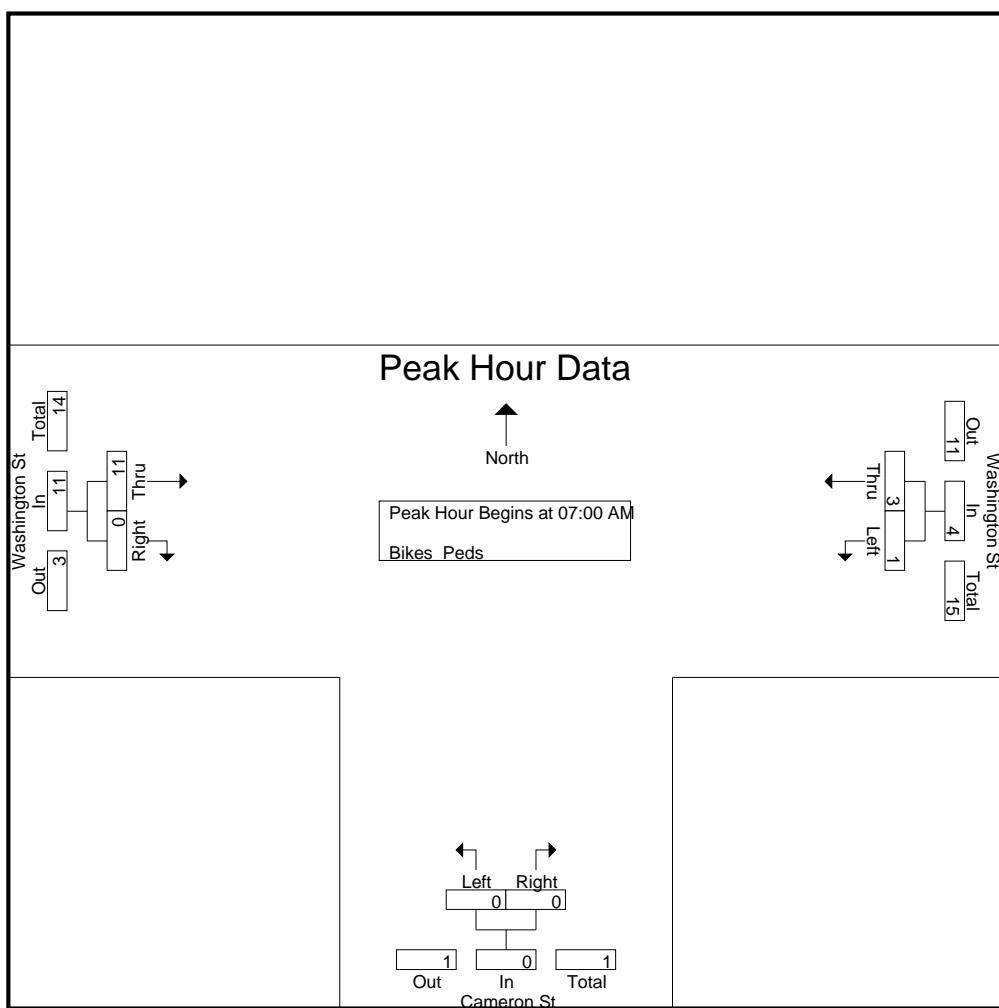
File Name : 547J00R2  
 Site Code : 547J0002  
 Start Date : 10/4/2018  
 Page No : 11

	Washington St			Cameron St			Washington St			
	From East			From South			From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:00 AM

07:00 AM	1	1	<b>2</b>	0	0	0	1	0	1	3
07:15 AM	0	0	0	0	0	0	3	0	3	3
07:30 AM	0	0	0	0	0	0	3	0	3	3
07:45 AM	0	<b>2</b>	2	0	0	0	<b>4</b>	0	<b>4</b>	<b>6</b>
Total Volume	1	3	4	0	0	0	11	0	11	15
% App. Total	25	75		0	0		100	0		
PHF	.250	.375	.500	.000	.000	.000	.688	.000	.688	.625



**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

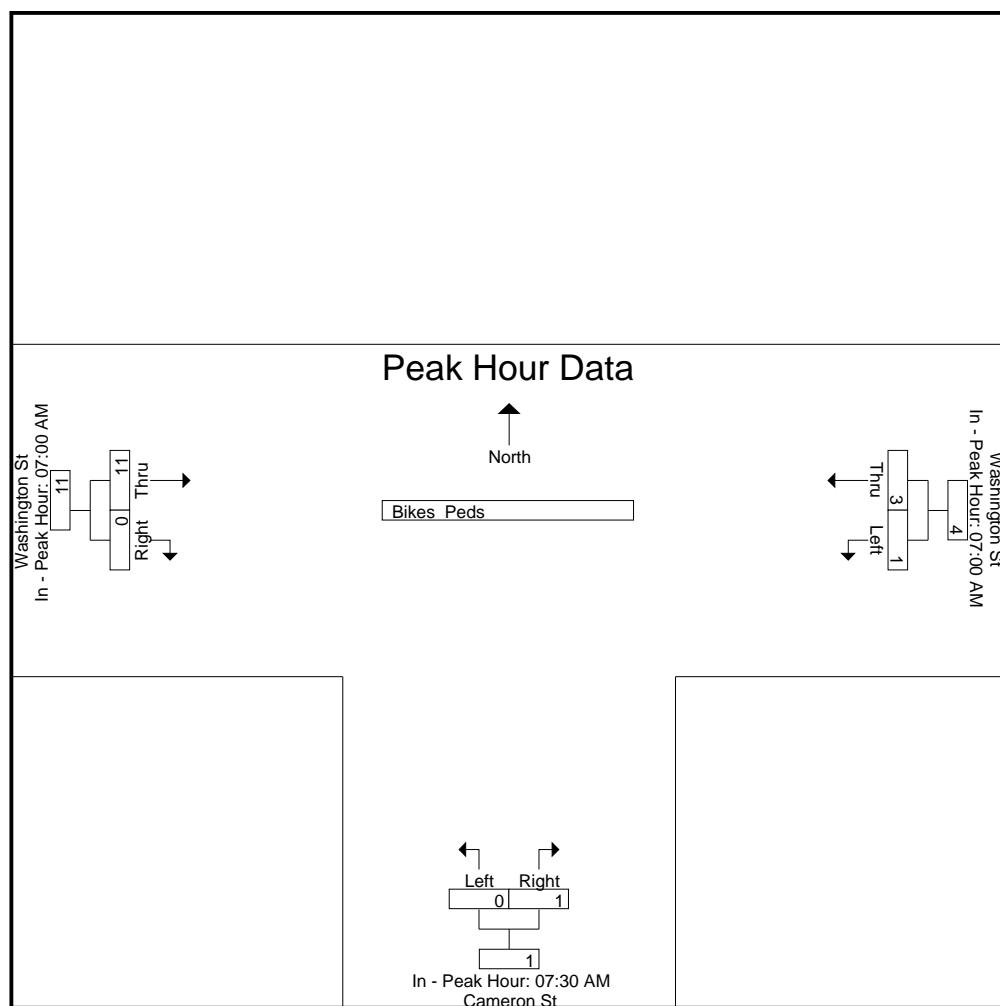
File Name : 547J00R2  
 Site Code : 547J0002  
 Start Date : 10/4/2018  
 Page No : 12

	Washington St From East			Cameron St From South			Washington St From West			Int. Total
	Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM	07:30 AM			07:00 AM				
+0 mins.	1	1	<b>2</b>	0	0	0	1	0	1
+15 mins.	0	0	0	0	0	0	3	0	3
+30 mins.	0	0	0	0	0	0	3	0	3
+45 mins.	0	<b>2</b>	2	0	1	1	<b>4</b>	0	<b>4</b>
Total Volume	1	3	4	0	1	1	11	0	11
% App. Total	25	75		0	100		100	0	
PHF	.250	.375	.500	.000	.250	.250	.688	.000	.688



**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

File Name : 547J00R2  
 Site Code : 547J0002  
 Start Date : 10/4/2018  
 Page No : 1

Groups Printed- Cars - Trucks

	Washington St From East		Cameron St From South		Washington St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
02:00 PM	14	175	0	13	174	3	379
02:15 PM	9	145	0	19	156	4	333
02:30 PM	11	222	0	17	161	7	418
02:45 PM	5	212	0	15	164	7	403
Total	39	754	0	64	655	21	1533
03:00 PM	17	209	0	27	161	9	423
03:15 PM	9	168	0	30	168	10	385
03:30 PM	7	174	0	18	112	6	317
03:45 PM	5	166	0	20	165	11	367
Total	38	717	0	95	606	36	1492
Grand Total	77	1471	0	159	1261	57	3025
Apprch %	5	95	0	100	95.7	4.3	
Total %	2.5	48.6	0	5.3	41.7	1.9	
Cars	77	1453	0	157	1253	57	2997
% Cars	100	98.8	0	98.7	99.4	100	99.1
Trucks	0	18	0	2	8	0	28
% Trucks	0	1.2	0	1.3	0.6	0	0.9

**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

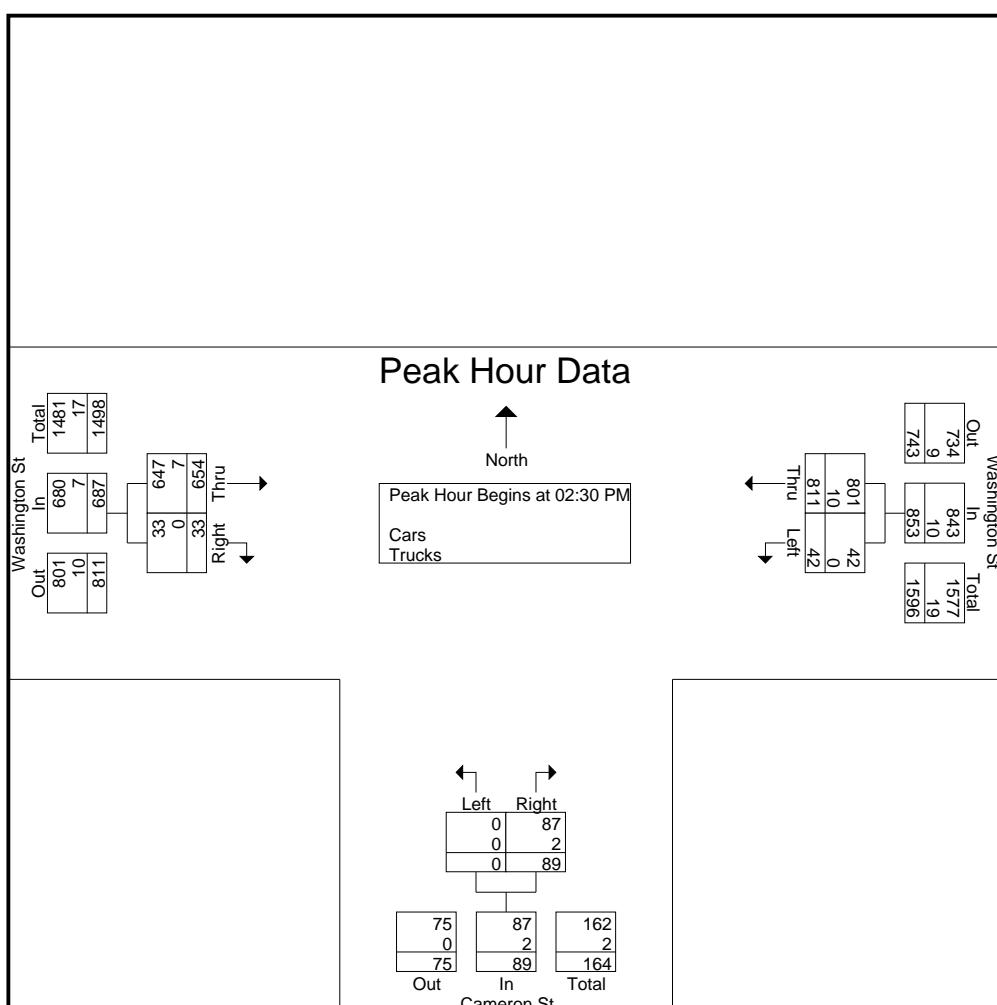
File Name : 547J00R2  
 Site Code : 547J0002  
 Start Date : 10/4/2018  
 Page No : 2

	Washington St From East			Cameron St From South			Washington St From West			Int. Total
	Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 02:30 PM

02:30 PM	11	222	233	0	17	17	161	7	168	418
02:45 PM	5	212	217	0	15	15	164	7	171	403
03:00 PM	17	209	226	0	27	27	161	9	170	423
03:15 PM	9	168	177	0	30	30	168	10	178	385
Total Volume	42	811	853	0	89	89	654	33	687	1629
% App. Total	4.9	95.1		0	100		95.2	4.8		
PHF	.618	.913	.915	.000	.742	.742	.973	.825	.965	.963
Cars	42	801	843	0	87	87	647	33	680	1610
% Cars	100	98.8	98.8	0	97.8	97.8	98.9	100	99.0	98.8
Trucks	0	10	10	0	2	2	7	0	7	19
% Trucks	0	1.2	1.2	0	2.2	2.2	1.1	0	1.0	1.2



**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

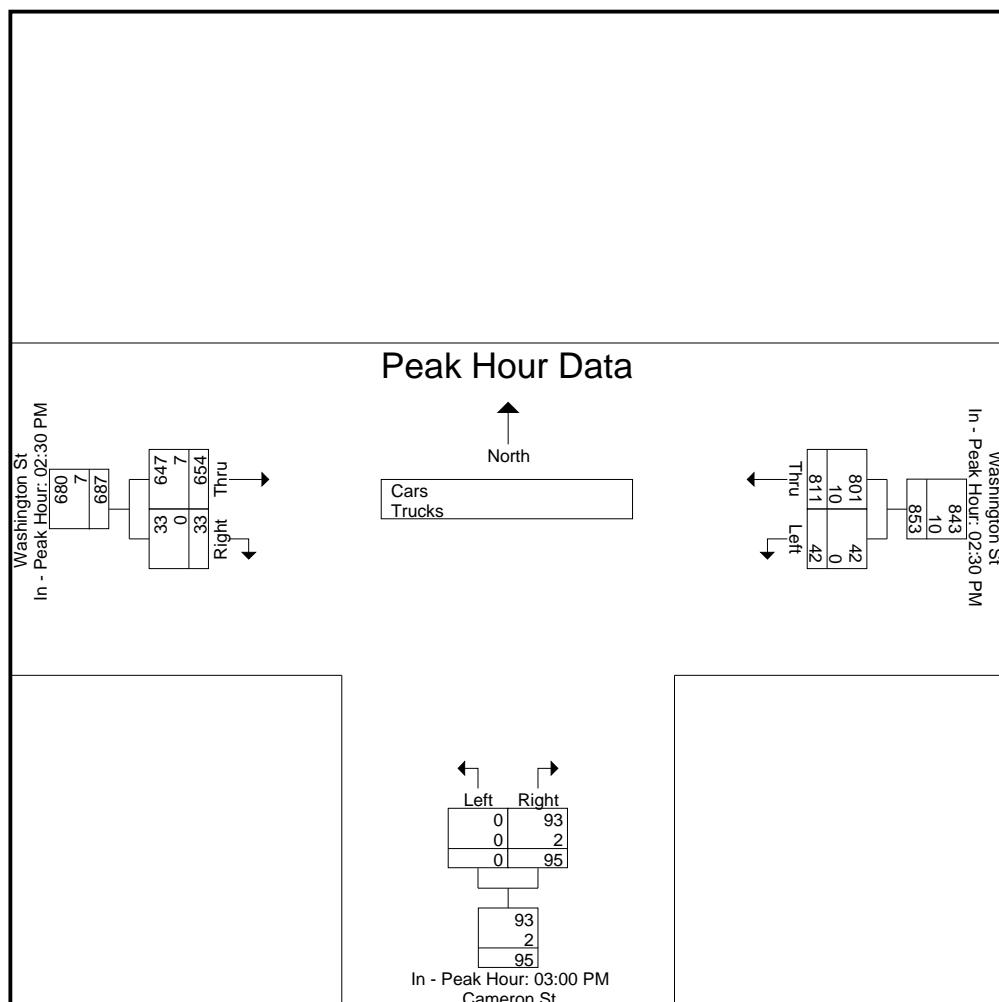
File Name : 547J00R2  
 Site Code : 547J0002  
 Start Date : 10/4/2018  
 Page No : 3

	Washington St From East			Cameron St From South			Washington St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	02:30 PM		03:00 PM		02:30 PM					
+0 mins.	11	<b>222</b>	<b>233</b>	0	27	27	161	7	168	
+15 mins.	5	212	217	0	<b>30</b>	<b>30</b>	164	7	171	
+30 mins.	<b>17</b>	209	226	0	18	18	161	9	170	
+45 mins.	9	168	177	0	20	20	<b>168</b>	<b>10</b>	<b>178</b>	
Total Volume	42	811	853	0	95	95	654	33	687	
% App. Total	4.9	95.1		0	100		95.2	4.8		
PHF	.618	.913	.915	.000	.792	.792	.973	.825	.965	
Cars	42	801	843	0	93	93	647	33	680	
% Cars	100	98.8	98.8	0	97.9	97.9	98.9	100	99	
Trucks	0	10	10	0	2	2	7	0	7	
% Trucks	0	1.2	1.2	0	2.1	2.1	1.1	0	1	



**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

File Name : 547J00R2  
 Site Code : 547J0002  
 Start Date : 10/4/2018  
 Page No : 4

Groups Printed- Cars

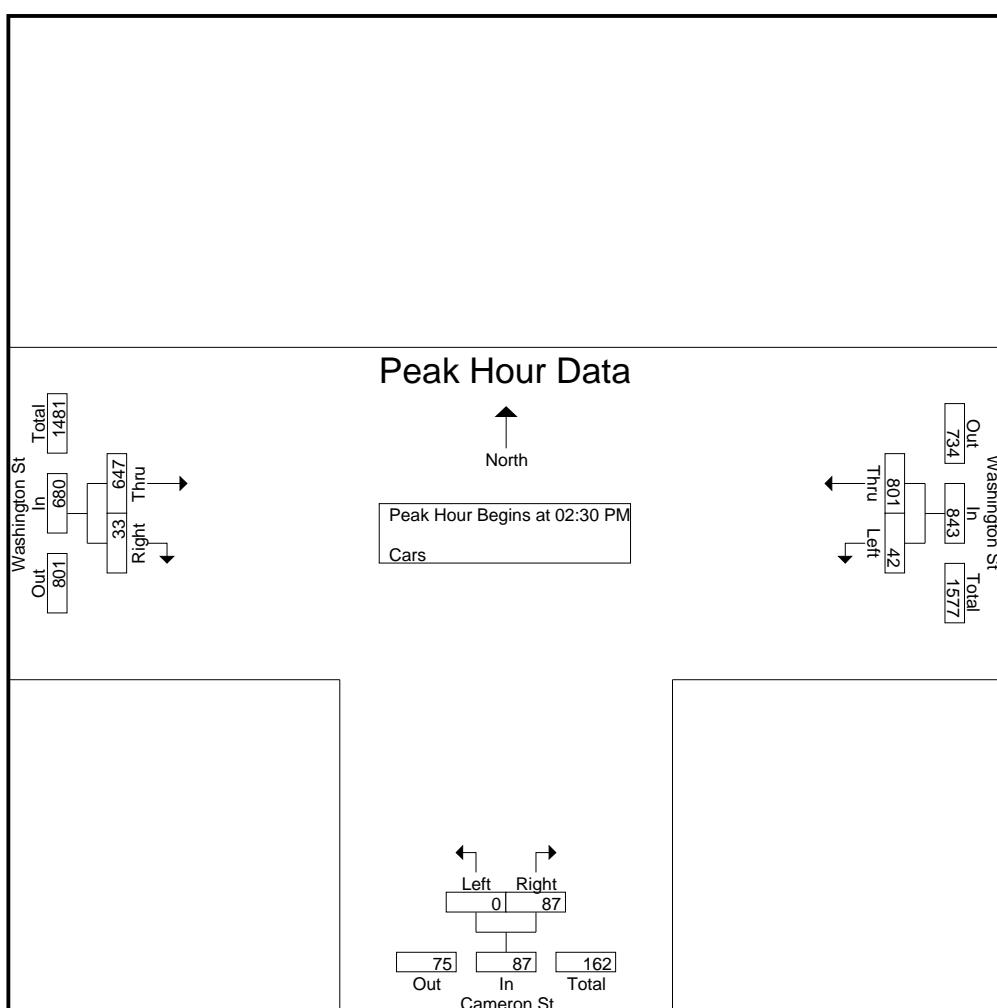
	Washington St From East		Cameron St From South		Washington St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
02:00 PM	14	175	0	13	173	3	378
02:15 PM	9	145	0	19	156	4	333
02:30 PM	11	222	0	17	161	7	418
02:45 PM	5	210	0	15	161	7	398
Total	39	752	0	64	651	21	1527
03:00 PM	17	206	0	26	161	9	419
03:15 PM	9	163	0	29	164	10	375
03:30 PM	7	170	0	18	112	6	313
03:45 PM	5	162	0	20	165	11	363
Total	38	701	0	93	602	36	1470
Grand Total	77	1453	0	157	1253	57	2997
Apprch %	5	95	0	100	95.6	4.4	
Total %	2.6	48.5	0	5.2	41.8	1.9	

**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

File Name : 547J00R2  
 Site Code : 547J0002  
 Start Date : 10/4/2018  
 Page No : 5

	Washington St			Cameron St			Washington St			Int. Total	
	From East			From South			From West				
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total		
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1											
Peak Hour for Entire Intersection Begins at 02:30 PM											
02:30 PM	11	222	233	0	17	17	161	7	168	418	
02:45 PM	5	210	215	0	15	15	161	7	168	398	
03:00 PM	17	206	223	0	26	26	161	9	170	419	
03:15 PM	9	163	172	0	29	29	164	10	174	375	
Total Volume	42	801	843	0	87	87	647	33	680	1610	
% App. Total	5	95		0	100		95.1	4.9			
PHF	.618	.902	.905	.000	.750	.750	.986	.825	.977	.961	



**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

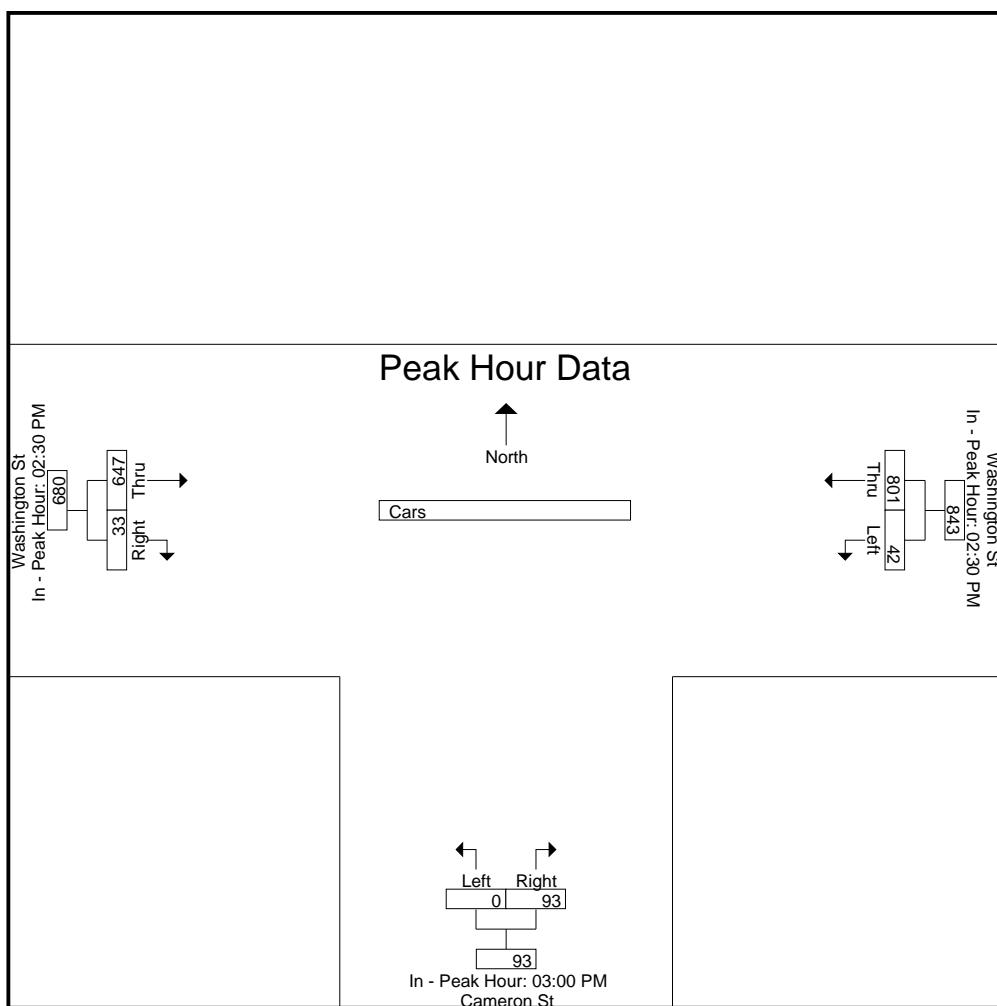
File Name : 547J00R2  
 Site Code : 547J0002  
 Start Date : 10/4/2018  
 Page No : 6

	Washington St From East			Cameron St From South			Washington St From West			Int. Total
	Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	02:30 PM	03:00 PM			02:30 PM		
+0 mins.	11 <b>222</b> <b>233</b>	0	26	26	161	7	168
+15 mins.	5      210      215	0	<b>29</b>	<b>29</b>	161	7	168
+30 mins.	<b>17</b> 206      223	0	18	18	161	9	170
+45 mins.	9      163      172	0	20	20	<b>164</b>	<b>10</b>	<b>174</b>
Total Volume	42      801      843	0	93	93	647	33	680
% App. Total	5      95	0	100		95.1	4.9	
PHF	.618      .902      .905	.000	.802	.802	.986	.825	.977



**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

File Name : 547J00R2  
 Site Code : 547J0002  
 Start Date : 10/4/2018  
 Page No : 7

Groups Printed- Trucks

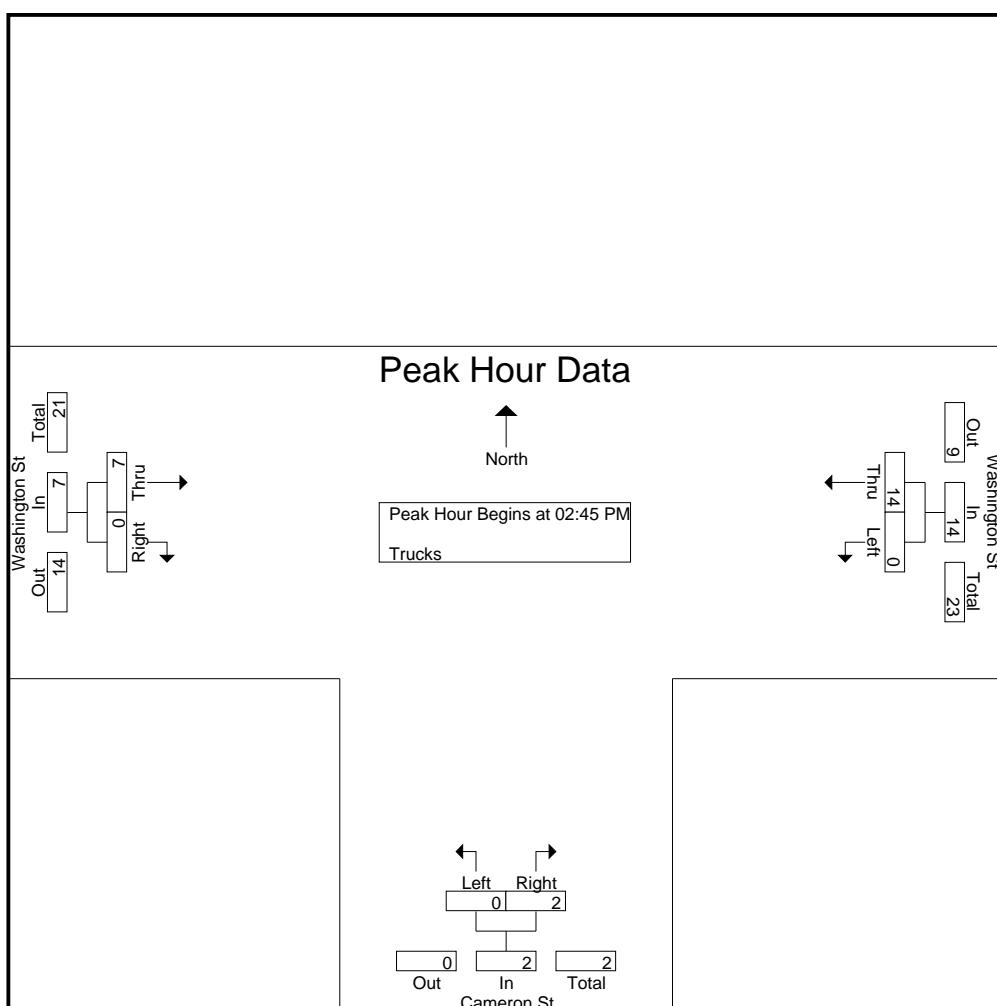
	Washington St From East		Cameron St From South		Washington St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
02:00 PM	0	0	0	0	1	0	1
02:15 PM	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0
02:45 PM	0	2	0	0	3	0	5
Total	0	2	0	0	4	0	6
03:00 PM	0	3	0	1	0	0	4
03:15 PM	0	5	0	1	4	0	10
03:30 PM	0	4	0	0	0	0	4
03:45 PM	0	4	0	0	0	0	4
Total	0	16	0	2	4	0	22
Grand Total	0	18	0	2	8	0	28
Apprch %	0	100	0	100	100	0	
Total %	0	64.3	0	7.1	28.6	0	

**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

File Name : 547J00R2  
 Site Code : 547J0002  
 Start Date : 10/4/2018  
 Page No : 8

	Washington St From East			Cameron St From South			Washington St From West			Int. Total	
	Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1											
Peak Hour for Entire Intersection Begins at 02:45 PM											
02:45 PM	0	2	2	2	0	0	0	3	0	3	5
03:00 PM	0	3	3	3	0	1	1	0	0	0	4
03:15 PM	0	5	5	5	0	1	1	4	0	4	10
03:30 PM	0	4	4	4	0	0	0	0	0	0	4
Total Volume	0	14	14	14	0	2	2	7	0	7	23
% App. Total	0	100			0	100		100	0		
PHF	.000	.700	.700	.700	.000	.500	.500	.438	.000	.438	.575



**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

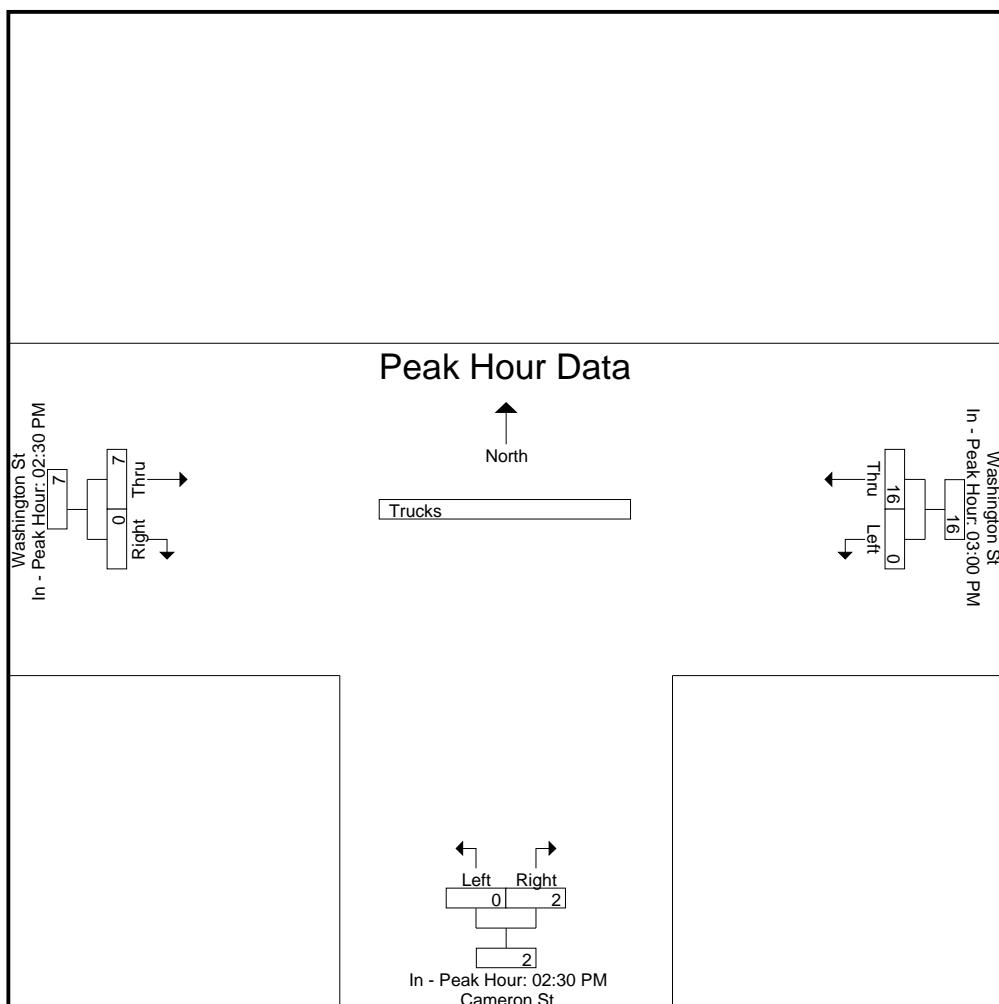
File Name : 547J00R2  
 Site Code : 547J0002  
 Start Date : 10/4/2018  
 Page No : 9

	Washington St From East			Cameron St From South			Washington St From West			Int. Total
	Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	03:00 PM	02:30 PM			02:30 PM			
+0 mins.	0	3	3	0	0	0	0	0
+15 mins.	0	5	5	0	0	0	3	3
+30 mins.	0	4	4	0	1	1	0	0
+45 mins.	0	4	4	0	1	1	4	4
Total Volume	0	16	16	0	2	2	7	7
% App. Total	0	100		0	100		100	0
PHF	.000	.800	.800	.000	.500	.500	.438	.438



**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

File Name : 547J00R2  
 Site Code : 547J0002  
 Start Date : 10/4/2018  
 Page No : 10

Groups Printed- Bikes Peds

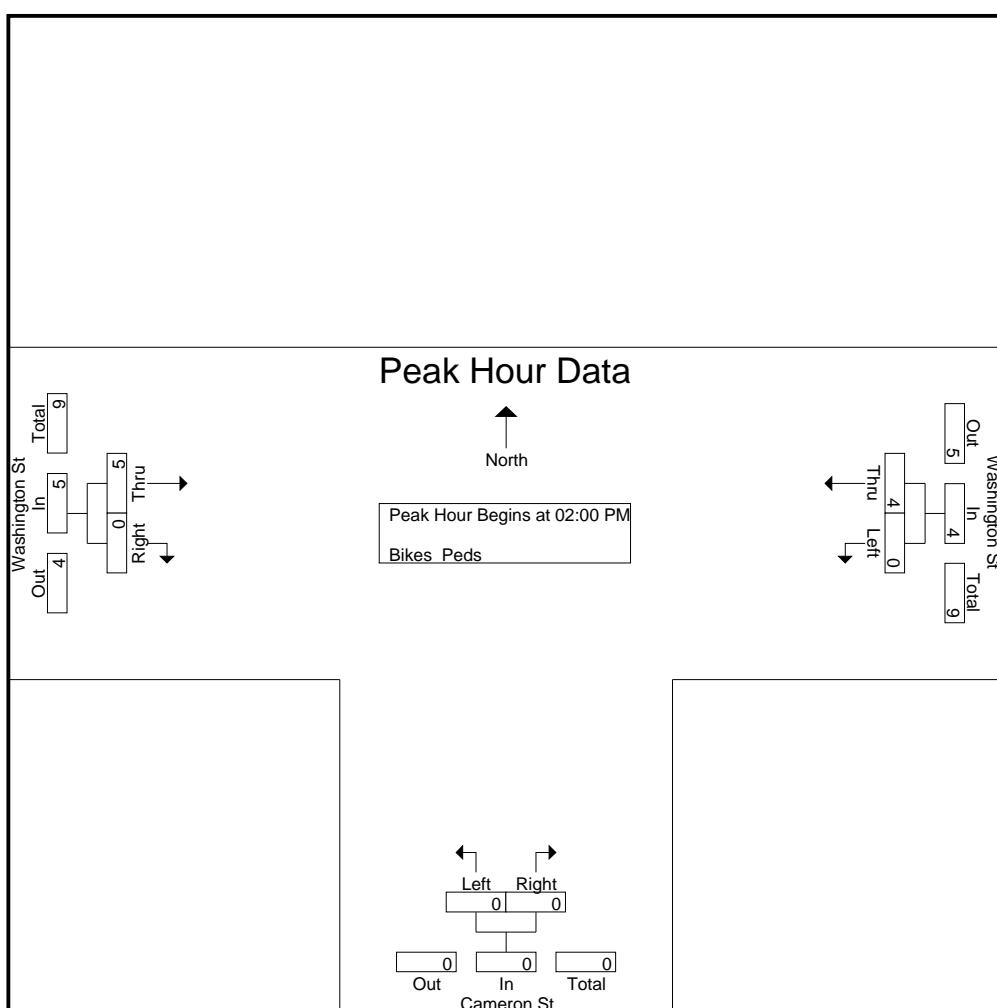
	Washington St From East			Cameron St From South			Washington St From West						
	Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Excl. Total	Incl. Total	Int. Total
02:00 PM		0	0	0	0	0	11	1	0	16	27	1	28
02:15 PM		0	0	0	0	0	14	0	0	11	25	0	25
02:30 PM		0	3	0	0	0	3	1	0	11	14	4	18
02:45 PM		0	1	0	0	0	17	3	0	10	27	4	31
Total		0	4	0	0	0	45	5	0	48	93	9	102
03:00 PM		0	0	0	0	0	7	0	0	9	16	0	16
03:15 PM		0	0	0	0	0	8	0	0	11	19	0	19
03:30 PM		1	0	0	0	0	10	0	0	14	24	1	25
03:45 PM		0	1	1	2	0	2	0	0	6	9	3	12
Total		1	1	1	2	0	27	0	0	40	68	4	72
Grand Total		1	5	1	2	0	72	5	0	88	161	13	174
Apprch %		16.7	83.3		100	0		100	0				
Total %		7.7	38.5		15.4	0		38.5	0		92.5	7.5	

**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

File Name : 547J00R2  
 Site Code : 547J0002  
 Start Date : 10/4/2018  
 Page No : 11

	Washington St			Cameron St			Washington St			Int. Total	
	From East			From South			From West				
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total		
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1											
Peak Hour for Entire Intersection Begins at 02:00 PM											
02:00 PM	0	0	0	0	0	0	1	0	1	1	
02:15 PM	0	0	0	0	0	0	0	0	0	0	
02:30 PM	0	3	3	0	0	0	1	0	1	4	
02:45 PM	0	1	1	0	0	0	3	0	3	4	
Total Volume	0	4	4	0	0	0	5	0	5	9	
% App. Total	0	100		0	0		100	0			
PHF	.000	.333	.333	.000	.000	.000	.417	.000	.417	.563	



**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

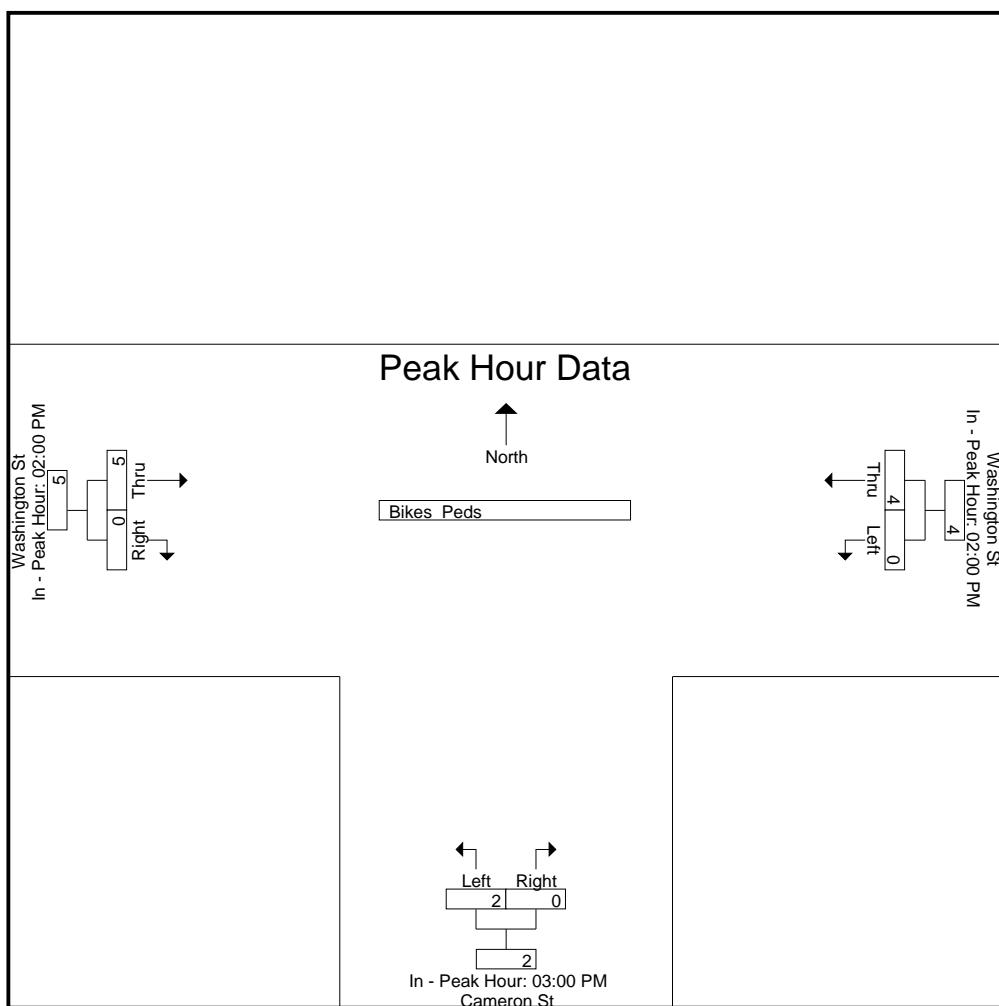
File Name : 547J00R2  
 Site Code : 547J0002  
 Start Date : 10/4/2018  
 Page No : 12

	Washington St			Cameron St			Washington St			Int. Total
	From East			From South			From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	02:00 PM	03:00 PM			02:00 PM			
+0 mins.	0	0	0	0	0	0	1	1
+15 mins.	0	0	0	0	0	0	0	0
+30 mins.	0	3	3	0	0	0	1	1
+45 mins.	0	1	1	2	0	2	3	3
Total Volume	0	4	4	2	0	2	5	5
% App. Total	0	100		100	0		100	0
PHF	.000	.333	.333	.250	.000	.250	.417	.417



**Accurate Counts**  
978-664-2565

N/S Street : Library Driveway  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

File Name : 547J00R3  
 Site Code : 547J0003  
 Start Date : 10/4/2018  
 Page No : 1

Groups Printed- Cars - Trucks

	Washington St From East		Library Dwy From South		Washington St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	0	93	0	1	326	0	420
07:15 AM	2	128	0	0	314	0	444
07:30 AM	1	127	0	1	305	0	434
07:45 AM	4	161	0	1	328	1	495
Total	7	509	0	3	1273	1	1793
08:00 AM	3	156	0	3	275	4	441
08:15 AM	2	168	0	6	382	3	561
08:30 AM	2	189	0	3	275	3	472
08:45 AM	6	170	0	0	278	7	461
Total	13	683	0	12	1210	17	1935
Grand Total	20	1192	0	15	2483	18	3728
Apprch %	1.7	98.3	0	100	99.3	0.7	
Total %	0.5	32	0	0.4	66.6	0.5	
Cars	20	1175	0	15	2455	18	3683
% Cars	100	98.6	0	100	98.9	100	98.8
Trucks	0	17	0	0	28	0	45
% Trucks	0	1.4	0	0	1.1	0	1.2

**Accurate Counts**  
978-664-2565

N/S Street : Library Driveway  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

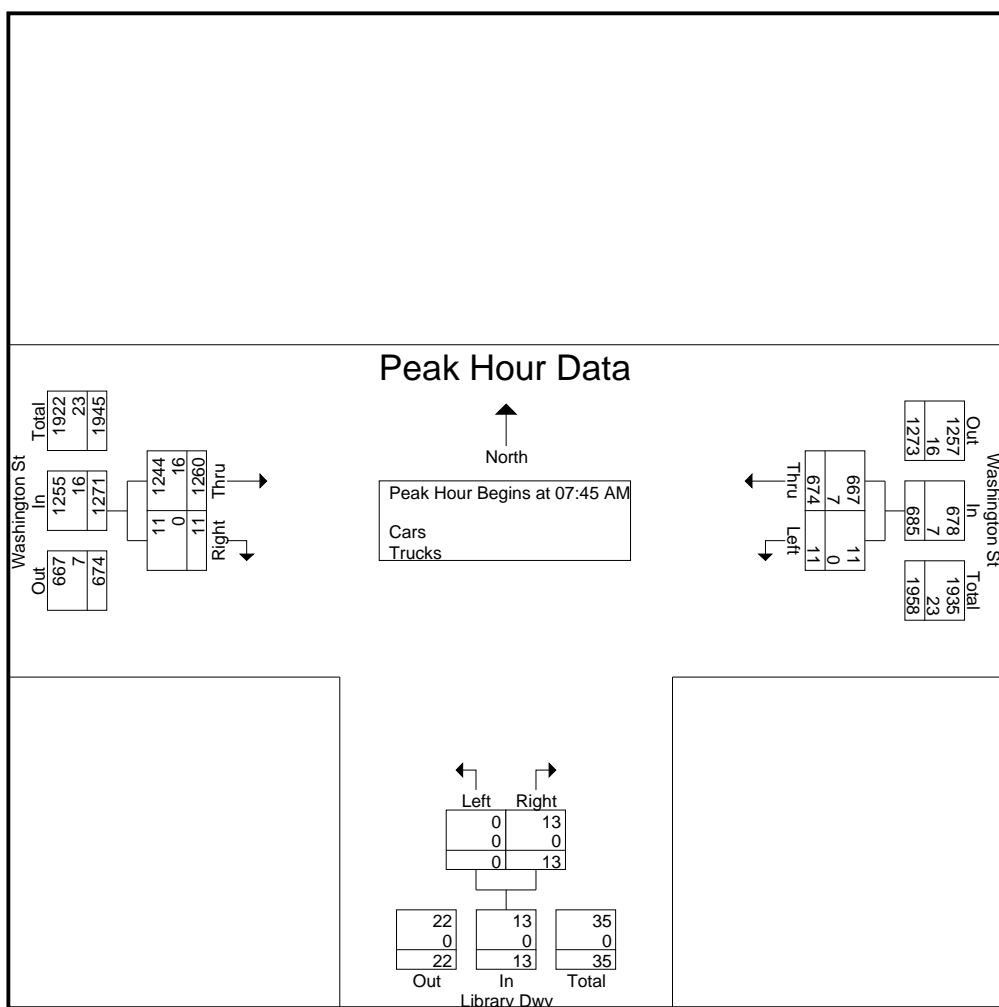
File Name : 547J00R3  
 Site Code : 547J0003  
 Start Date : 10/4/2018  
 Page No : 2

	Washington St			Library Dwy			Washington St			
	From East			From South			From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:45 AM

07:45 AM	4	161	165	0	1	1	328	1	329	495
08:00 AM	3	156	159	0	3	3	275	4	279	441
08:15 AM	2	168	170	0	6	6	382	3	385	561
08:30 AM	2	189	191	0	3	3	275	3	278	472
Total Volume	11	674	685	0	13	13	1260	11	1271	1969
% App. Total	1.6	98.4		0	100		99.1	0.9		
PHF	.688	.892	.897	.000	.542	.542	.825	.688	.825	.877
Cars	11	667	678	0	13	13	1244	11	1255	1946
% Cars	100	99.0	99.0	0	100	100	98.7	100	98.7	98.8
Trucks	0	7	7	0	0	0	16	0	16	23
% Trucks	0	1.0	1.0	0	0	0	1.3	0	1.3	1.2



**Accurate Counts**  
978-664-2565

N/S Street : Library Driveway  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

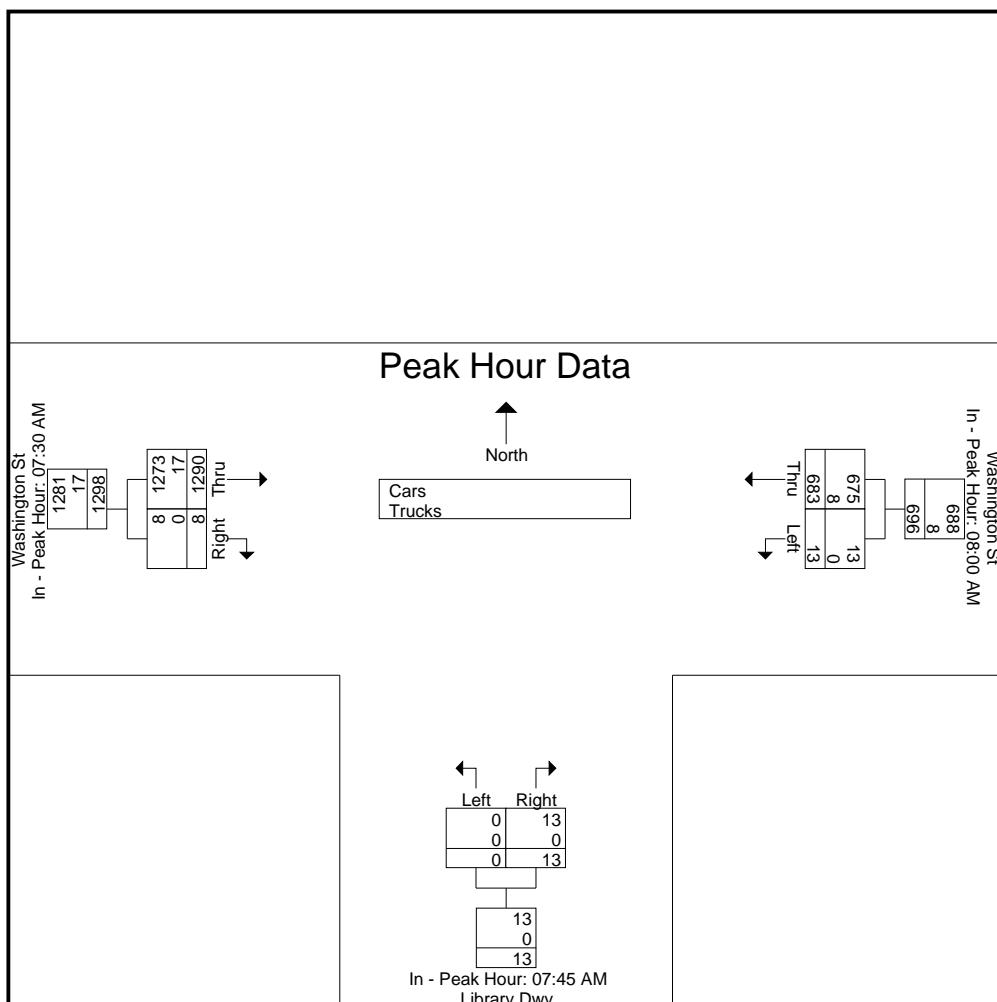
File Name : 547J00R3  
 Site Code : 547J0003  
 Start Date : 10/4/2018  
 Page No : 3

	Washington St From East			Library Dwy From South			Washington St From West			Int. Total
	Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:00 AM	07:45 AM			07:30 AM		
+0 mins.	3 156 159	0	1	1	305	0	305
+15 mins.	2 168 170	0	3	3	328	1	329
+30 mins.	2 189 191	0	6	6	275	4	279
+45 mins.	6 170 176	0	3	3	382	3	385
Total Volume	13 683 696	0	13	13	1290	8	1298
% App. Total	1.9 98.1	0	100		99.4	0.6	
PHF	.542 .903 .911	.000	.542	.542	.844	.500	.843
Cars	13 675 688	0	13	13	1273	8	1281
% Cars	100 98.8 98.9	0	100	100	98.7	100	98.7
Trucks	0 8 8	0	0	0	17	0	17
% Trucks	0 1.2 1.1	0	0	0	1.3	0	1.3



**Accurate Counts**  
978-664-2565

N/S Street : Library Driveway  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

File Name : 547J00R3  
 Site Code : 547J0003  
 Start Date : 10/4/2018  
 Page No : 4

Groups Printed- Cars

	Washington St From East		Library Dwy From South		Washington St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	0	89	0	1	324	0	414
07:15 AM	2	125	0	0	313	0	440
07:30 AM	1	125	0	1	300	0	427
07:45 AM	4	161	0	1	321	1	488
Total	7	500	0	3	1258	1	1769
08:00 AM	3	154	0	3	271	4	435
08:15 AM	2	167	0	6	381	3	559
08:30 AM	2	185	0	3	271	3	464
08:45 AM	6	169	0	0	274	7	456
Total	13	675	0	12	1197	17	1914
Grand Total	20	1175	0	15	2455	18	3683
Apprch %	1.7	98.3	0	100	99.3	0.7	
Total %	0.5	31.9	0	0.4	66.7	0.5	

**Accurate Counts**  
978-664-2565

N/S Street : Library Driveway  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

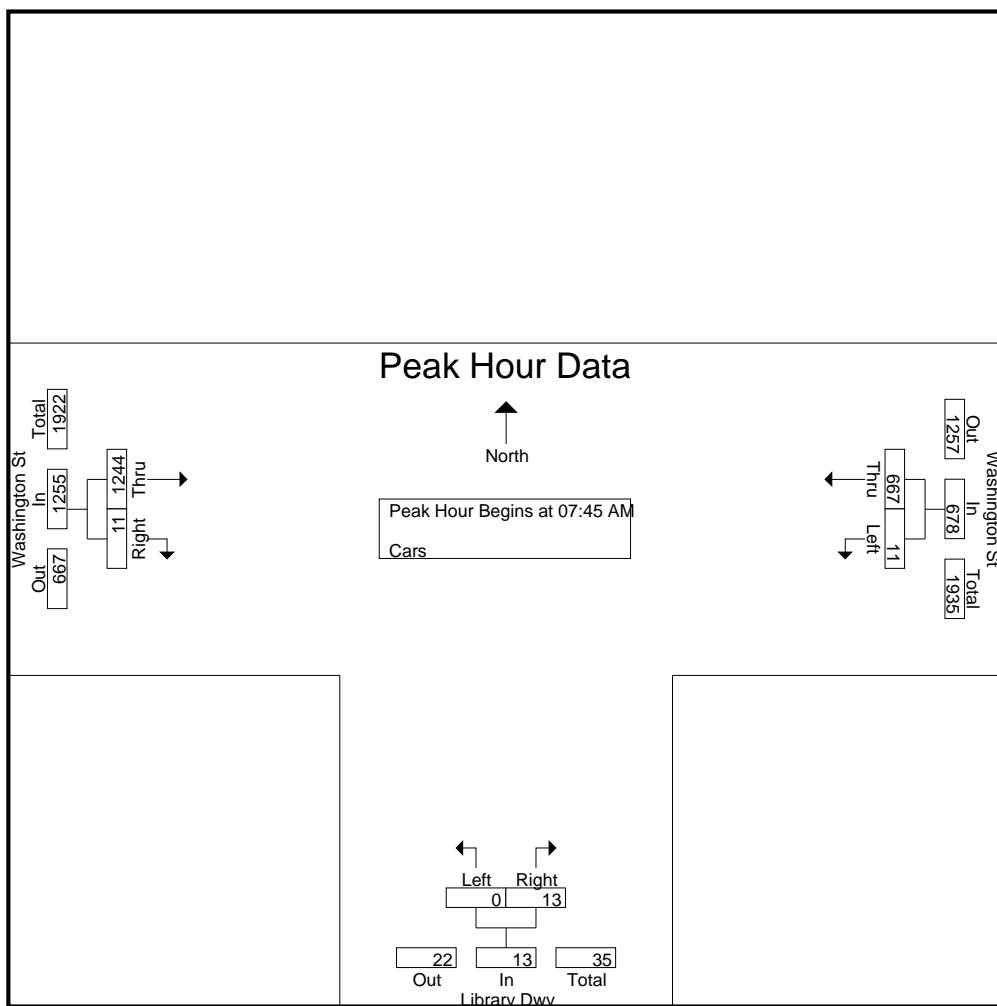
File Name : 547J00R3  
 Site Code : 547J0003  
 Start Date : 10/4/2018  
 Page No : 5

	Washington St			Library Dwy			Washington St			
	From East			From South			From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:45 AM

07:45 AM	4	161	165	0	1	1	321	1	322	488
08:00 AM	3	154	157	0	3	3	271	4	275	435
08:15 AM	2	167	169	0	6	6	381	3	384	559
08:30 AM	2	185	187	0	3	3	271	3	274	464
Total Volume	11	667	678	0	13	13	1244	11	1255	1946
% App. Total	1.6	98.4		0	100		99.1	0.9		
PHF	.688	.901	.906	.000	.542	.542	.816	.688	.817	.870



**Accurate Counts**  
978-664-2565

N/S Street : Library Driveway  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

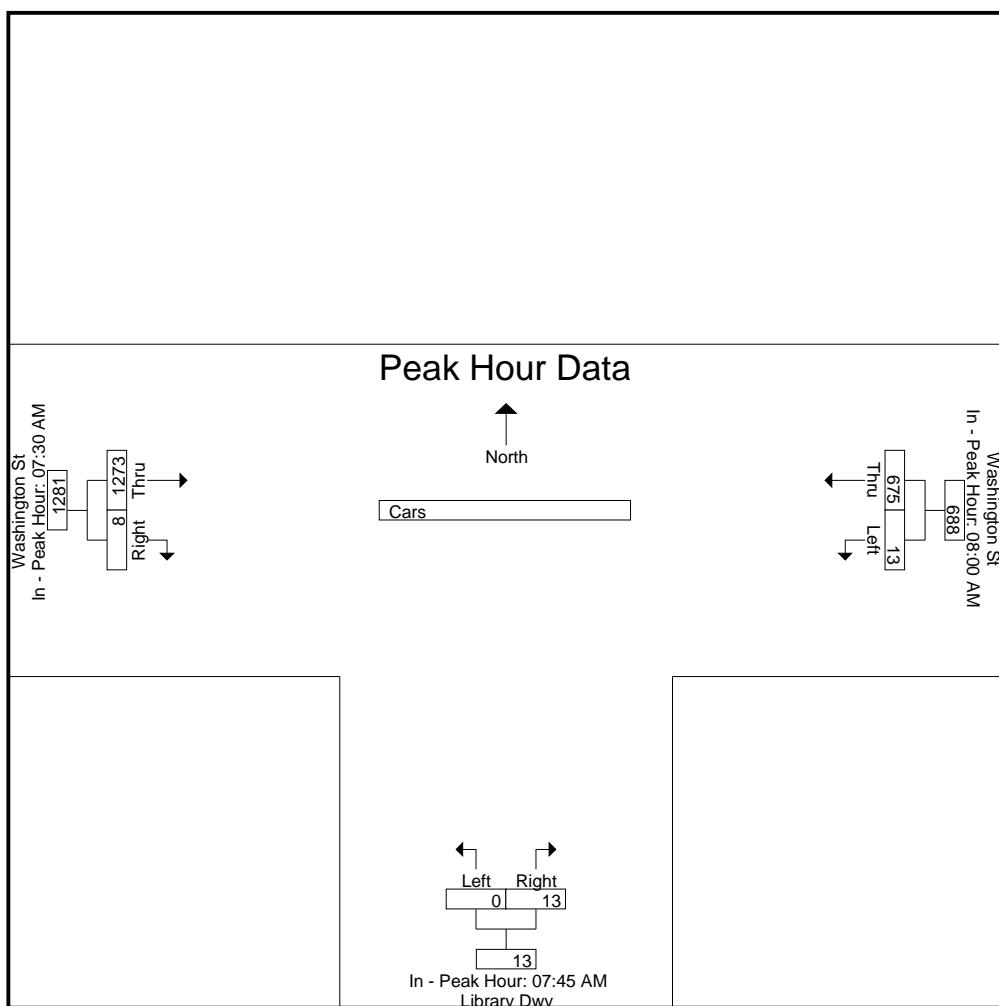
File Name : 547J00R3  
 Site Code : 547J0003  
 Start Date : 10/4/2018  
 Page No : 6

	Washington St From East			Library Dwy From South			Washington St From West			Int. Total
	Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:00 AM		07:45 AM		07:30 AM	
+0 mins.	3	154	157	0	1	1
+15 mins.	2	167	169	0	3	3
+30 mins.	2	<b>185</b>	<b>187</b>	0	<b>6</b>	<b>6</b>
+45 mins.	<b>6</b>	169	175	0	3	3
Total Volume	13	675	688	0	13	13
% App. Total	1.9	98.1		0	100	
PHF	.542	.912	.920	.000	.542	.542
					.835	.500
						.834



**Accurate Counts**  
978-664-2565

N/S Street : Library Driveway  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

File Name : 547J00R3  
 Site Code : 547J0003  
 Start Date : 10/4/2018  
 Page No : 7

Groups Printed- Trucks

	Washington St From East		Library Dwy From South		Washington St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	0	4	0	0	2	0	6
07:15 AM	0	3	0	0	1	0	4
07:30 AM	0	2	0	0	5	0	7
07:45 AM	0	0	0	0	7	0	7
Total	0	9	0	0	15	0	24
08:00 AM	0	2	0	0	4	0	6
08:15 AM	0	1	0	0	1	0	2
08:30 AM	0	4	0	0	4	0	8
08:45 AM	0	1	0	0	4	0	5
Total	0	8	0	0	13	0	21
Grand Total	0	17	0	0	28	0	45
Apprch %	0	100	0	0	100	0	
Total %	0	37.8	0	0	62.2	0	

**Accurate Counts**  
978-664-2565

N/S Street : Library Driveway  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

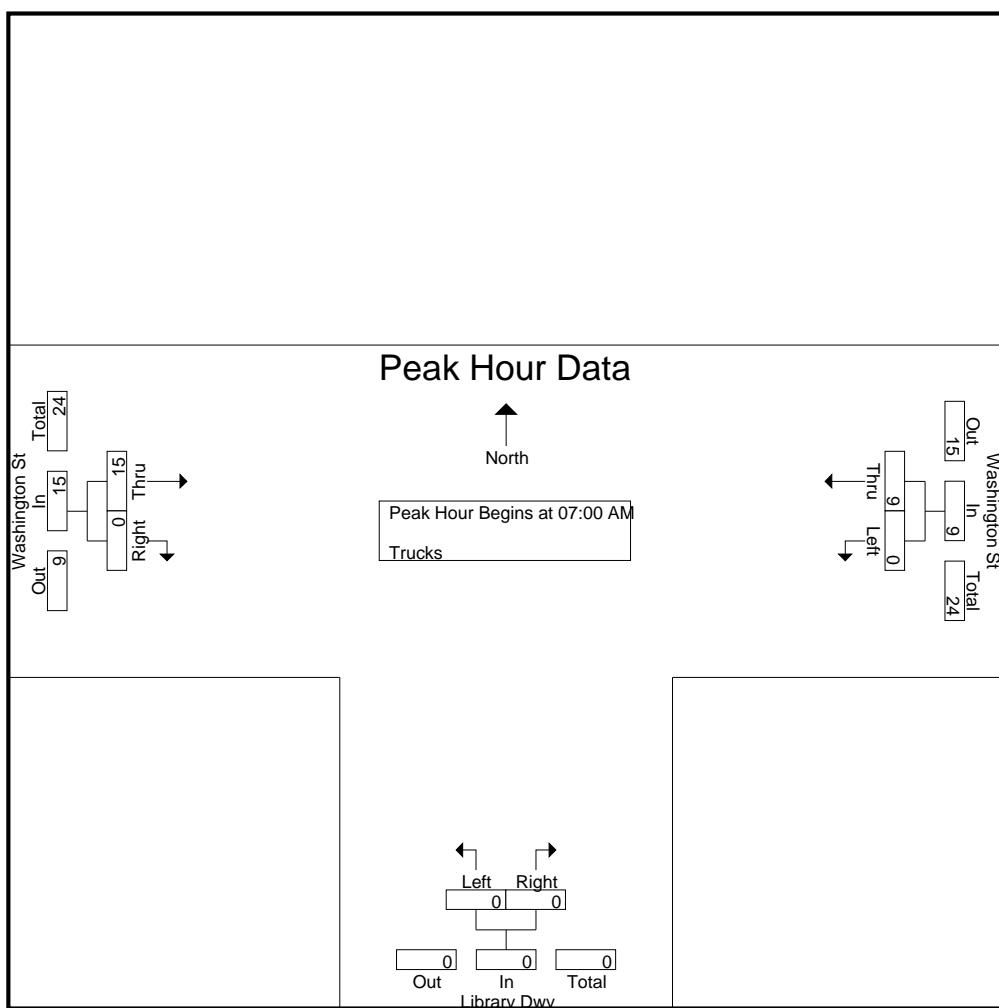
File Name : 547J00R3  
 Site Code : 547J0003  
 Start Date : 10/4/2018  
 Page No : 8

	Washington St			Library Dwy			Washington St			
	From East			From South			From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:00 AM

07:00 AM	0	4	4	0	0	0	2	0	2	6
07:15 AM	0	3	3	0	0	0	1	0	1	4
07:30 AM	0	2	2	0	0	0	5	0	5	7
07:45 AM	0	0	0	0	0	0	7	0	7	7
Total Volume	0	9	9	0	0	0	15	0	15	24
% App. Total	0	100		0	0		100	0		
PHF	.000	.563	.563	.000	.000	.000	.536	.000	.536	.857



**Accurate Counts**  
978-664-2565

N/S Street : Library Driveway  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

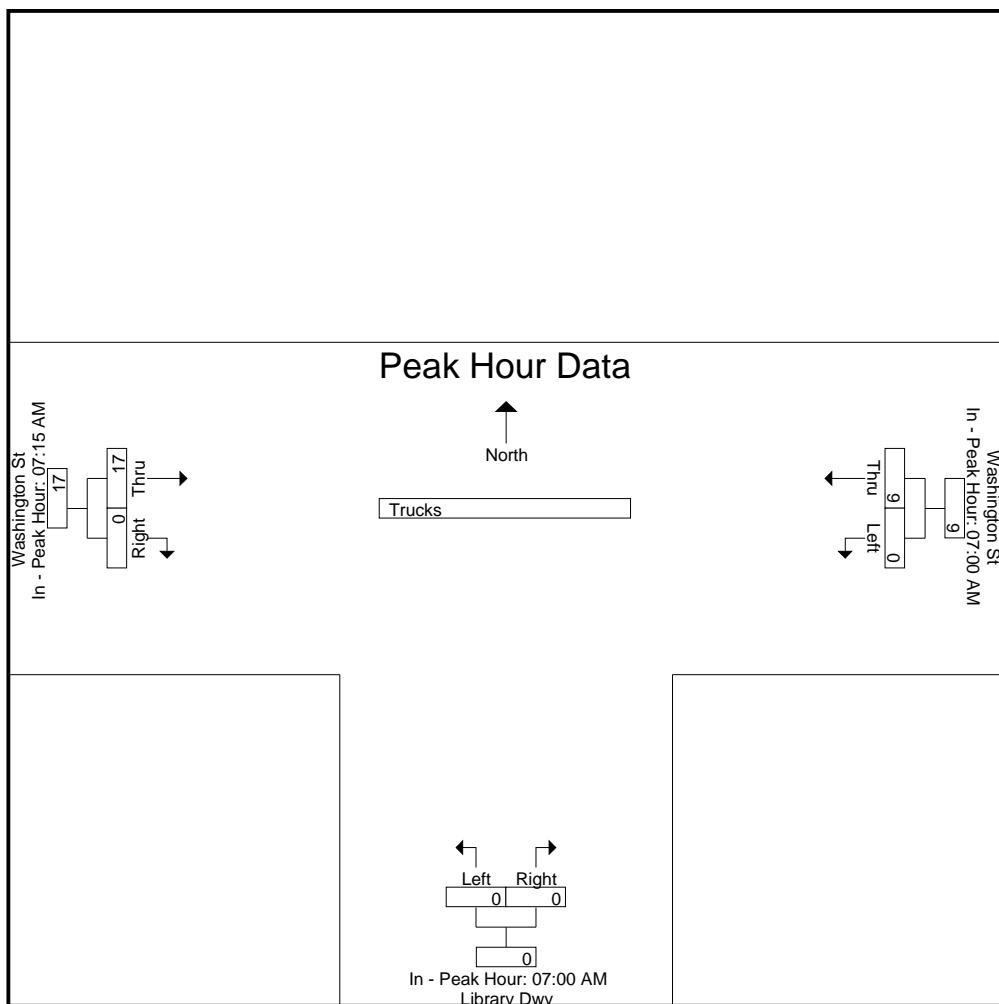
File Name : 547J00R3  
 Site Code : 547J0003  
 Start Date : 10/4/2018  
 Page No : 9

	Washington St From East			Library Dwy From South			Washington St From West			Int. Total
	Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM		07:00 AM		07:15 AM	
+0 mins.	0	4	4	0	0	0
+15 mins.	0	3	3	0	0	0
+30 mins.	0	2	2	0	0	0
+45 mins.	0	0	0	0	0	0
Total Volume	0	9	9	0	0	17
% App. Total	0	100		0	0	100
PHF	.000	.563	.563	.000	.000	.000
				.607	.000	.607



**Accurate Counts**  
978-664-2565

N/S Street : Library Driveway  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

File Name : 547J00R3  
 Site Code : 547J0003  
 Start Date : 10/4/2018  
 Page No : 10

Groups Printed- Bikes Peds

	Washington St From East			Library Dwy From South			Washington St From West						
	Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Excl. Total	Incl. Total	Int. Total
07:00 AM		0	2	0	0	0	0	0	1	0	0	3	3
07:15 AM		0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM		0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM		0	2	0	0	0	1	3	0	1	2	5	7
Total		0	4	0	0	0	1	3	1	1	2	8	10
08:00 AM		0	1	0	0	0	3	0	0	0	3	1	4
08:15 AM		0	0	0	0	0	5	1	0	0	5	1	6
08:30 AM		0	1	0	0	0	0	2	0	0	0	3	3
08:45 AM		0	1	0	0	0	5	0	0	0	5	1	6
Total		0	3	0	0	0	13	3	0	0	13	6	19
Grand Total		0	7	0	0	0	14	6	1	1	15	14	29
Apprch %		0	100		0	0		85.7	14.3				
Total %		0	50		0	0		42.9	7.1		51.7	48.3	

**Accurate Counts**  
978-664-2565

N/S Street : Library Driveway  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

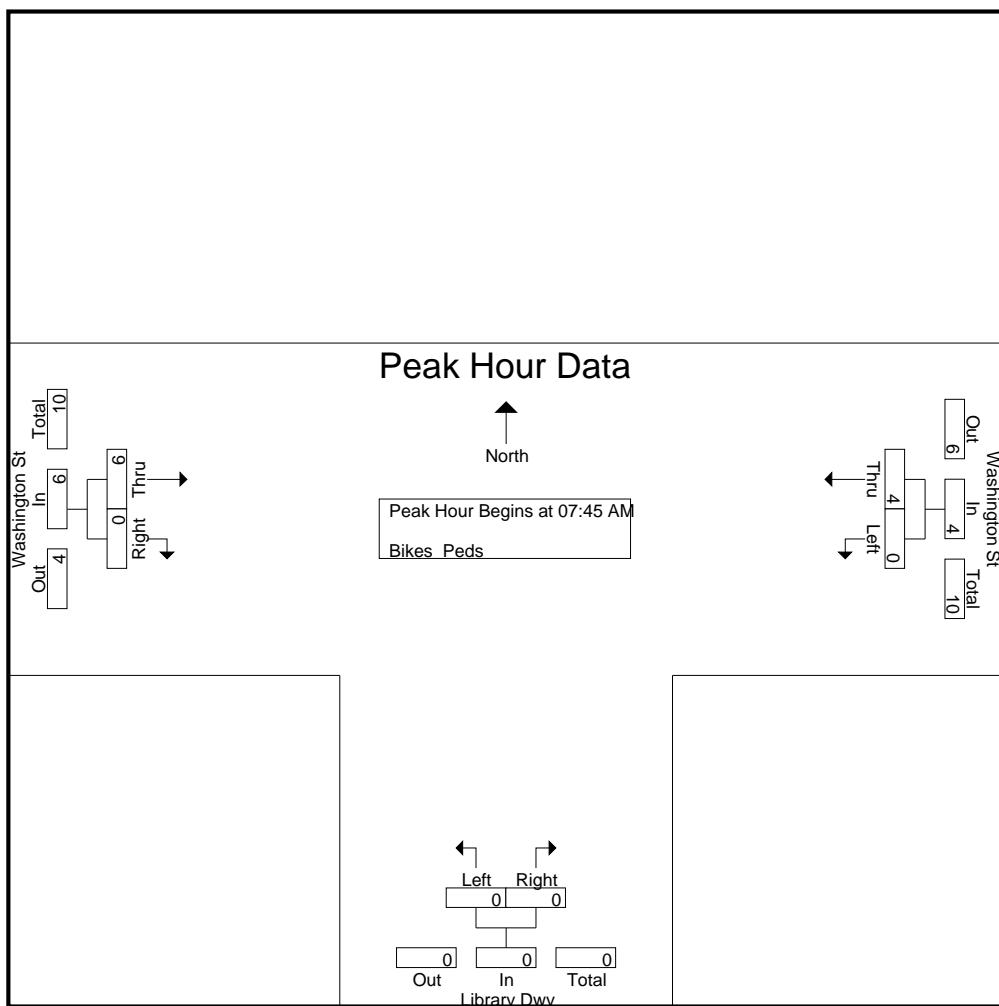
File Name : 547J00R3  
 Site Code : 547J0003  
 Start Date : 10/4/2018  
 Page No : 11

	Washington St			Library Dwy			Washington St			
	From East			From South			From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:45 AM

07:45 AM	0	2	2	0	0	0	3	0	3	5
08:00 AM	0	1	1	0	0	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	1	0	1	1
08:30 AM	0	1	1	0	0	0	2	0	2	3
Total Volume	0	4	4	0	0	0	6	0	6	10
% App. Total	0	100		0	0		100	0		
PHF	.000	.500	.500	.000	.000	.000	.500	.000	.500	.500



**Accurate Counts**  
978-664-2565

N/S Street : Library Driveway  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

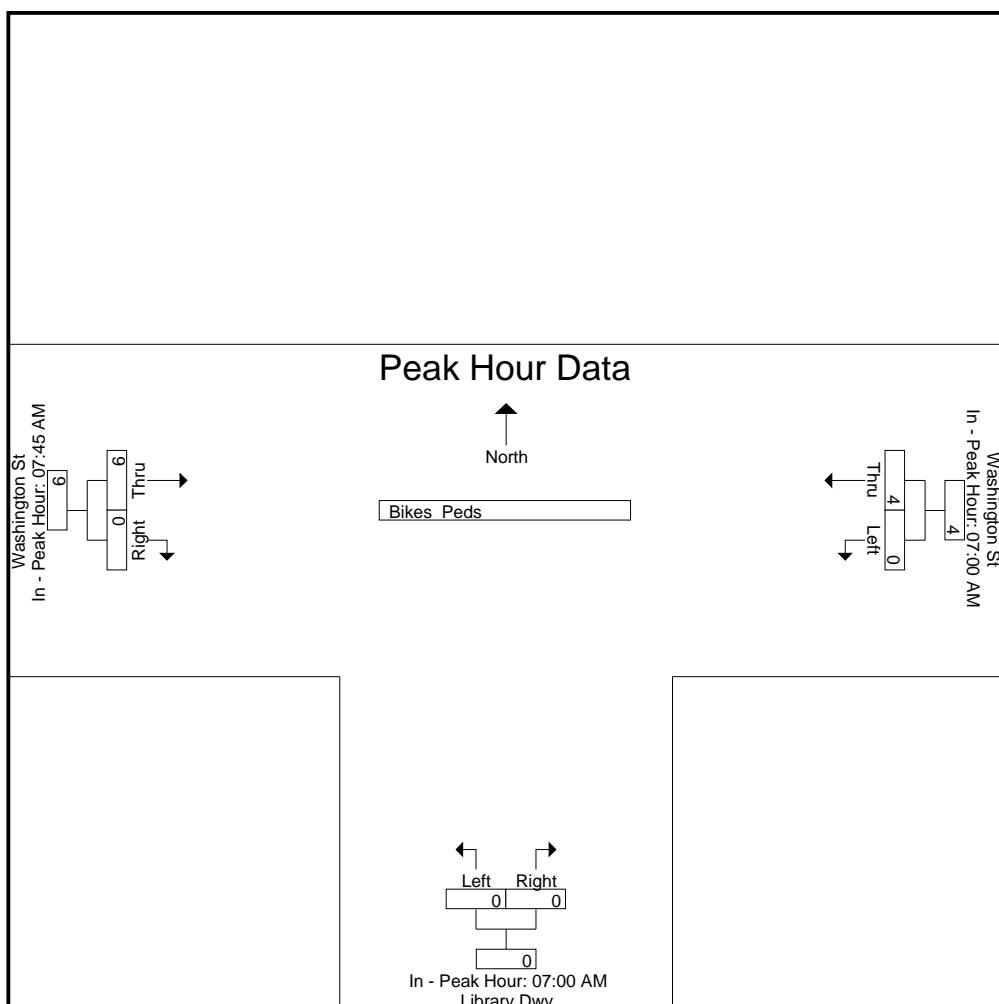
File Name : 547J00R3  
 Site Code : 547J0003  
 Start Date : 10/4/2018  
 Page No : 12

	Washington St From East			Library Dwy From South			Washington St From West			Int. Total
	Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM		07:00 AM		07:45 AM	
+0 mins.	0	2	2	0	0	0
+15 mins.	0	0	0	0	0	0
+30 mins.	0	0	0	0	1	0
+45 mins.	0	2	2	0	2	0
Total Volume	0	4	4	0	6	0
% App. Total	0	100		0	100	0
PHF	.000	.500	.500	.000	.500	.500



**Accurate Counts**  
978-664-2565

N/S Street : Library Driveway  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

File Name : 547J00R3  
 Site Code : 547J0003  
 Start Date : 10/4/2018  
 Page No : 1

Groups Printed- Cars - Trucks

	Washington St From East		Library Dwy From South		Washington St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
02:00 PM	6	191	0	13	178	9	397
02:15 PM	5	153	0	7	168	3	336
02:30 PM	9	224	0	13	178	7	431
02:45 PM	7	215	0	9	178	3	412
Total	27	783	0	42	702	22	1576
03:00 PM	4	222	0	16	169	7	418
03:15 PM	9	165	0	9	198	6	387
03:30 PM	7	182	0	7	129	2	327
03:45 PM	12	176	0	3	184	5	380
Total	32	745	0	35	680	20	1512
Grand Total	59	1528	0	77	1382	42	3088
Apprch %	3.7	96.3	0	100	97.1	2.9	
Total %	1.9	49.5	0	2.5	44.8	1.4	
Cars	59	1509	0	77	1370	42	3057
% Cars	100	98.8	0	100	99.1	100	99
Trucks	0	19	0	0	12	0	31
% Trucks	0	1.2	0	0	0.9	0	1

**Accurate Counts**  
978-664-2565

N/S Street : Library Driveway  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

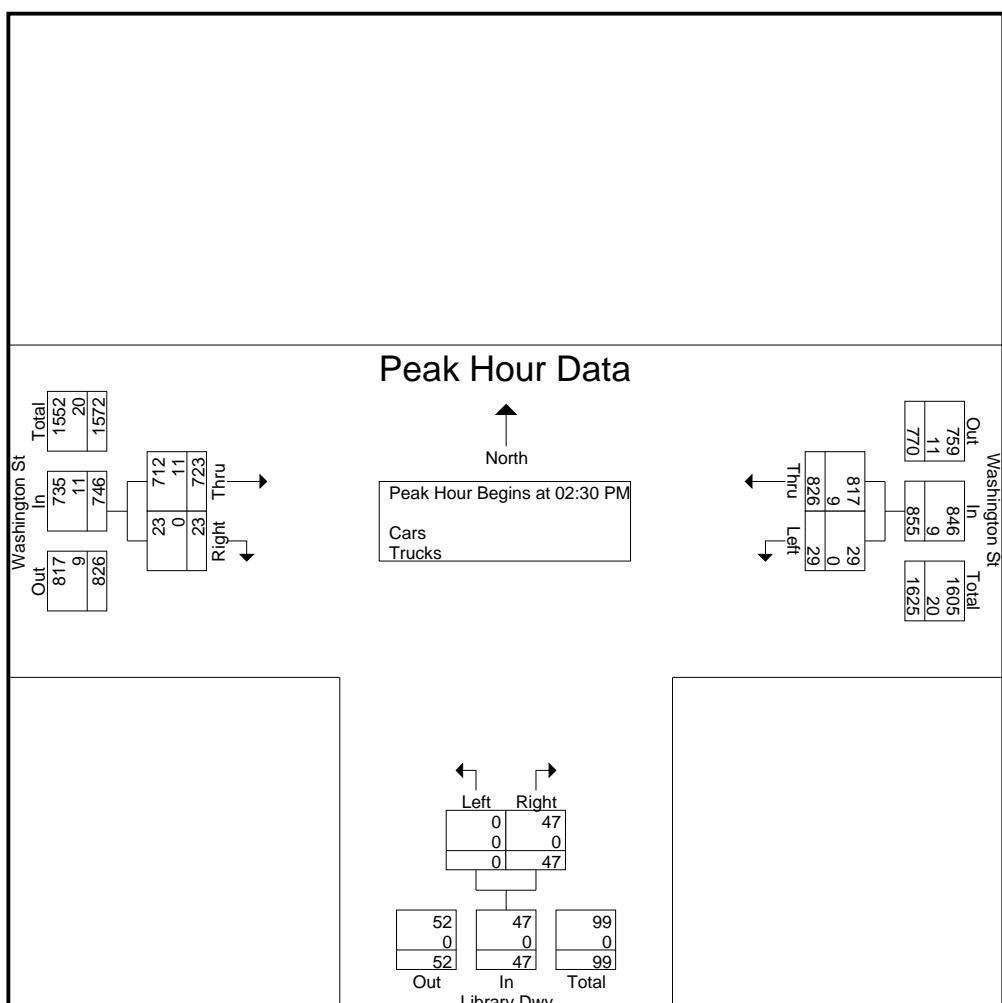
File Name : 547J00R3  
 Site Code : 547J0003  
 Start Date : 10/4/2018  
 Page No : 2

	Washington St From East			Library Dwy From South			Washington St From West			Int. Total
	Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 02:30 PM

02:30 PM	9	224	233	0	13	13	178	7	185	431
02:45 PM	7	215	222	0	9	9	178	3	181	412
03:00 PM	4	222	226	0	16	16	169	7	176	418
03:15 PM	9	165	174	0	9	9	198	6	204	387
Total Volume	29	826	855	0	47	47	723	23	746	1648
% App. Total	3.4	96.6		0	100		96.9	3.1		
PHF	.806	.922	.917	.000	.734	.734	.913	.821	.914	.956
Cars	29	817	846	0	47	47	712	23	735	1628
% Cars	100	98.9	98.9	0	100	100	98.5	100	98.5	98.8
Trucks	0	9	9	0	0	0	11	0	11	20
% Trucks	0	1.1	1.1	0	0	0	1.5	0	1.5	1.2



**Accurate Counts**  
978-664-2565

N/S Street : Library Driveway  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

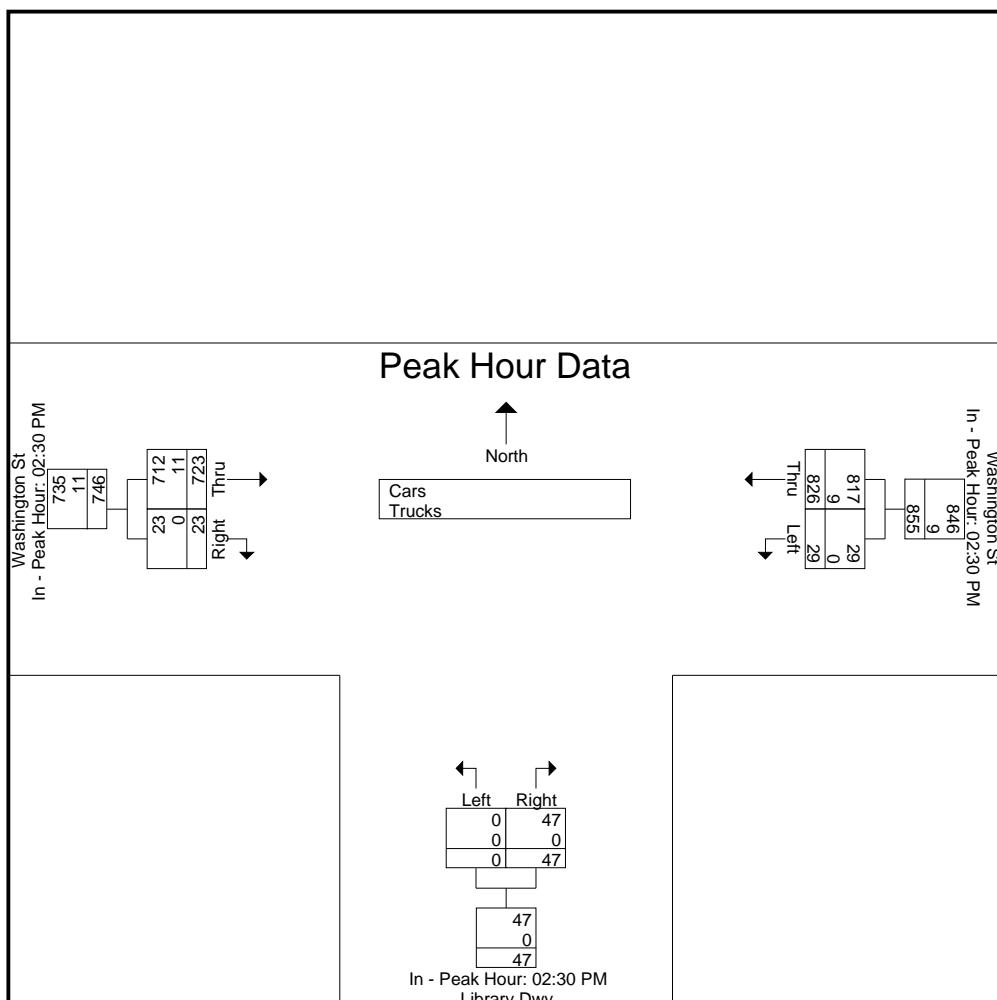
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 Start Date : 10/4/2018  
 Page No : 3

	Washington St From East			Library Dwy From South			Washington St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	02:30 PM		02:30 PM		02:30 PM	
+0 mins.	9	224	233	0	13	13
+15 mins.	7	215	222	0	9	9
+30 mins.	4	222	226	0	16	16
+45 mins.	9	165	174	0	9	9
Total Volume	29	826	855	0	47	47
% App. Total	3.4	96.6		0	100	
PHF	.806	.922	.917	.000	.734	.734
Cars	29	817	846	0	47	47
% Cars	100	98.9	98.9	0	100	100
Trucks	0	9	9	0	0	0
% Trucks	0	1.1	1.1	0	0	0



**Accurate Counts**  
978-664-2565

N/S Street : Library Driveway  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

File Name : 547J00R3  
 Site Code : 547J0003  
 Start Date : 10/4/2018  
 Page No : 4

Groups Printed- Cars

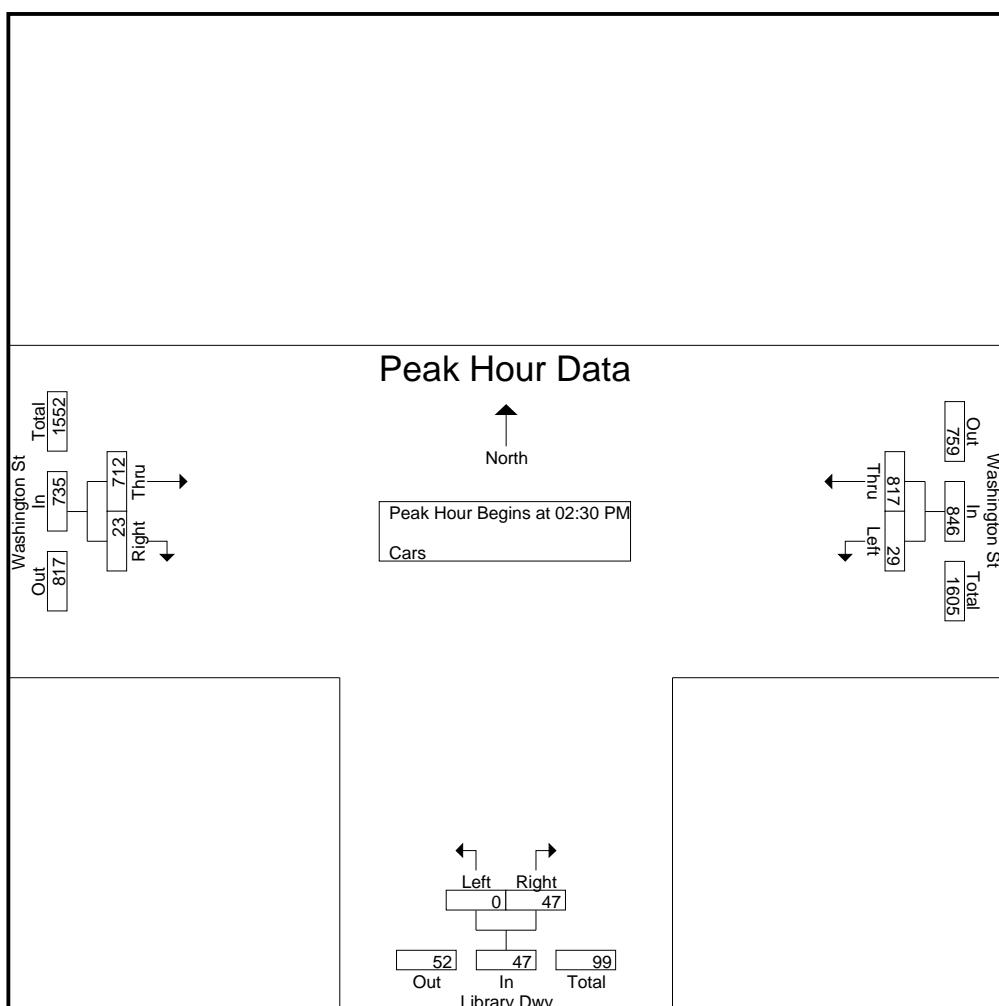
	Washington St From East		Library Dwy From South		Washington St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
02:00 PM	6	189	0	13	177	9	394
02:15 PM	5	153	0	7	168	3	336
02:30 PM	9	224	0	13	177	7	430
02:45 PM	7	213	0	9	174	3	406
Total	27	779	0	42	696	22	1566
03:00 PM	4	219	0	16	168	7	414
03:15 PM	9	161	0	9	193	6	378
03:30 PM	7	177	0	7	129	2	322
03:45 PM	12	173	0	3	184	5	377
Total	32	730	0	35	674	20	1491
Grand Total	59	1509	0	77	1370	42	3057
Apprch %	3.8	96.2	0	100	97	3	
Total %	1.9	49.4	0	2.5	44.8	1.4	

**Accurate Counts**  
978-664-2565

N/S Street : Library Driveway  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

File Name : 547J00R3  
 Site Code : 547J0003  
 Start Date : 10/4/2018  
 Page No : 5

	Washington St From East			Library Dwy From South			Washington St From West			Int. Total	
	Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1											
Peak Hour for Entire Intersection Begins at 02:30 PM											
02:30 PM	9	224	233		0	13	13	177	7	184	430
02:45 PM	7	213	220		0	9	9	174	3	177	406
03:00 PM	4	219	223		0	16	16	168	7	175	414
03:15 PM	9	161	170		0	9	9	193	6	199	378
Total Volume	29	817	846		0	47	47	712	23	735	1628
% App. Total	3.4	96.6			0	100		96.9	3.1		
PHF	.806	.912	.908		.000	.734	.734	.922	.821	.923	.947



**Accurate Counts**  
978-664-2565

N/S Street : Library Driveway  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

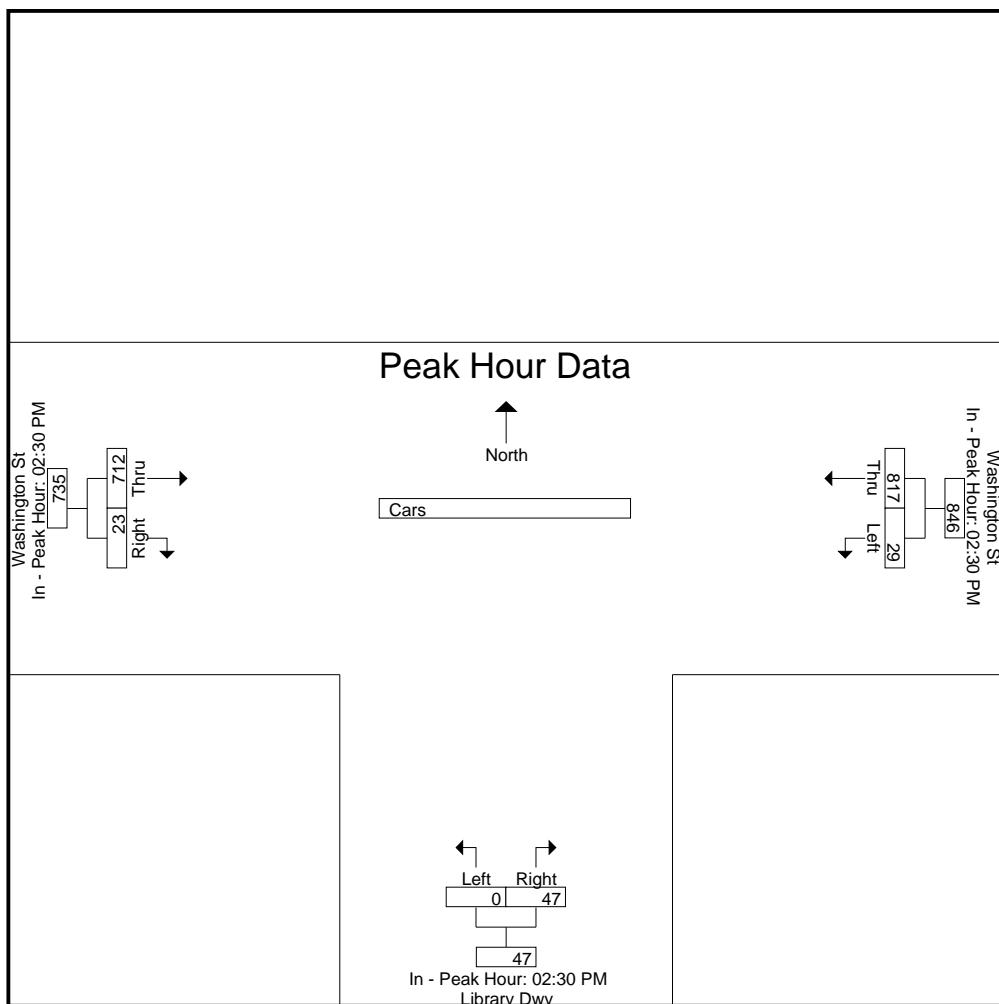
File Name : 547J00R3  
 Site Code : 547J0003  
 Start Date : 10/4/2018  
 Page No : 6

	Washington St From East			Library Dwy From South			Washington St From West			Int. Total
	Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	02:30 PM		02:30 PM		02:30 PM	
+0 mins.	<b>9</b>	<b>224</b>	<b>233</b>	0	13	13
+15 mins.	7	213	220	0	9	9
+30 mins.	4	219	223	0	<b>16</b>	<b>16</b>
+45 mins.	9	161	170	0	9	9
Total Volume	29	817	846	0	47	47
% App. Total	3.4	96.6		0	100	
PHF	.806	.912	.908	.000	.734	.734
					.922	.821
						.923



**Accurate Counts**  
978-664-2565

N/S Street : Library Driveway  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

File Name : 547J00R3  
 Site Code : 547J0003  
 Start Date : 10/4/2018  
 Page No : 7

Groups Printed- Trucks

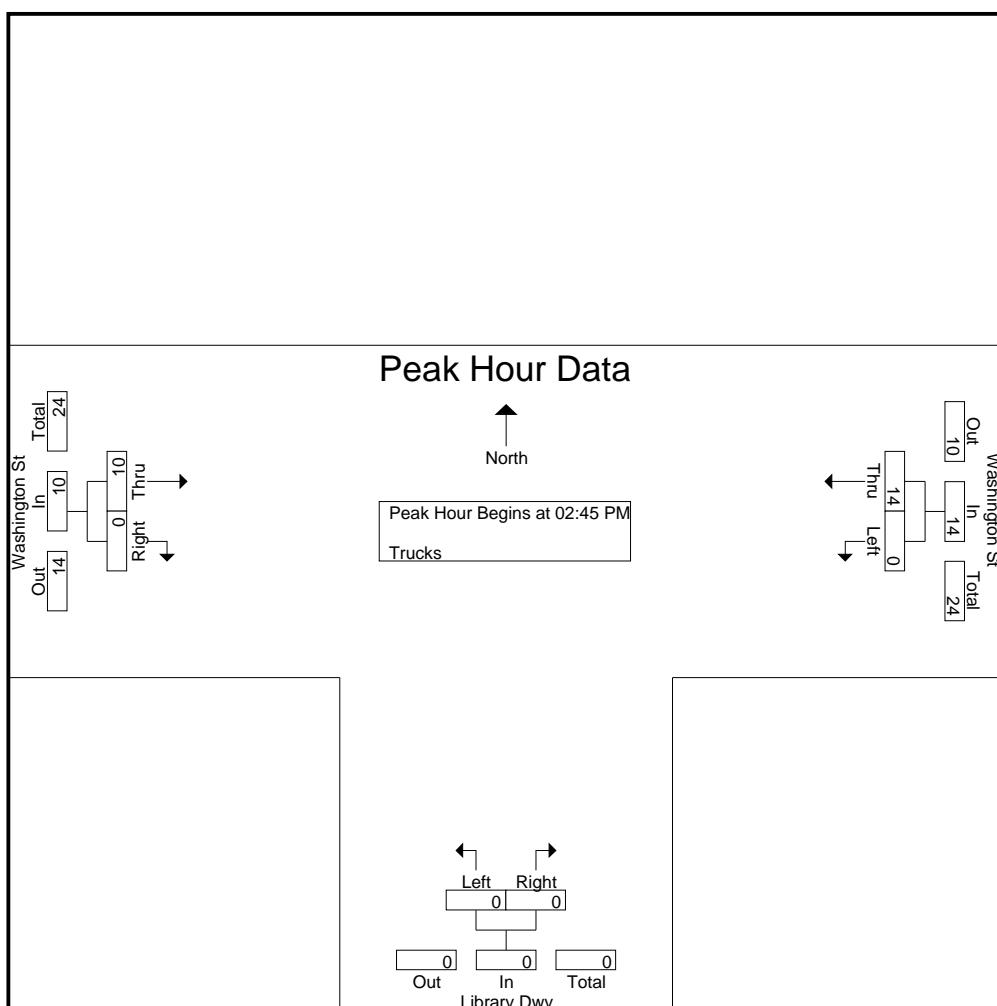
	Washington St From East		Library Dwy From South		Washington St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
02:00 PM	0	2	0	0	1	0	3
02:15 PM	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	1	0	1
02:45 PM	0	2	0	0	4	0	6
Total	0	4	0	0	6	0	10
03:00 PM	0	3	0	0	1	0	4
03:15 PM	0	4	0	0	5	0	9
03:30 PM	0	5	0	0	0	0	5
03:45 PM	0	3	0	0	0	0	3
Total	0	15	0	0	6	0	21
Grand Total	0	19	0	0	12	0	31
Apprch %	0	100	0	0	100	0	
Total %	0	61.3	0	0	38.7	0	

**Accurate Counts**  
978-664-2565

N/S Street : Library Driveway  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

File Name : 547J00R3  
 Site Code : 547J0003  
 Start Date : 10/4/2018  
 Page No : 8

	Washington St From East			Library Dwy From South			Washington St From West			Int. Total	
	Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1											
Peak Hour for Entire Intersection Begins at 02:45 PM											
02:45 PM	0	2	2	2	0	0	0	4	0	4	6
03:00 PM	0	3	3	3	0	0	0	1	0	1	4
03:15 PM	0	4	4	4	0	0	0	5	0	5	9
03:30 PM	0	5	5	5	0	0	0	0	0	0	5
Total Volume	0	14	14	14	0	0	0	10	0	10	24
% App. Total	0	100			0	0		100	0		
PHF	.000	.700	.700	.700	.000	.000	.000	.500	.000	.500	.667



**Accurate Counts**  
978-664-2565

N/S Street : Library Driveway  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

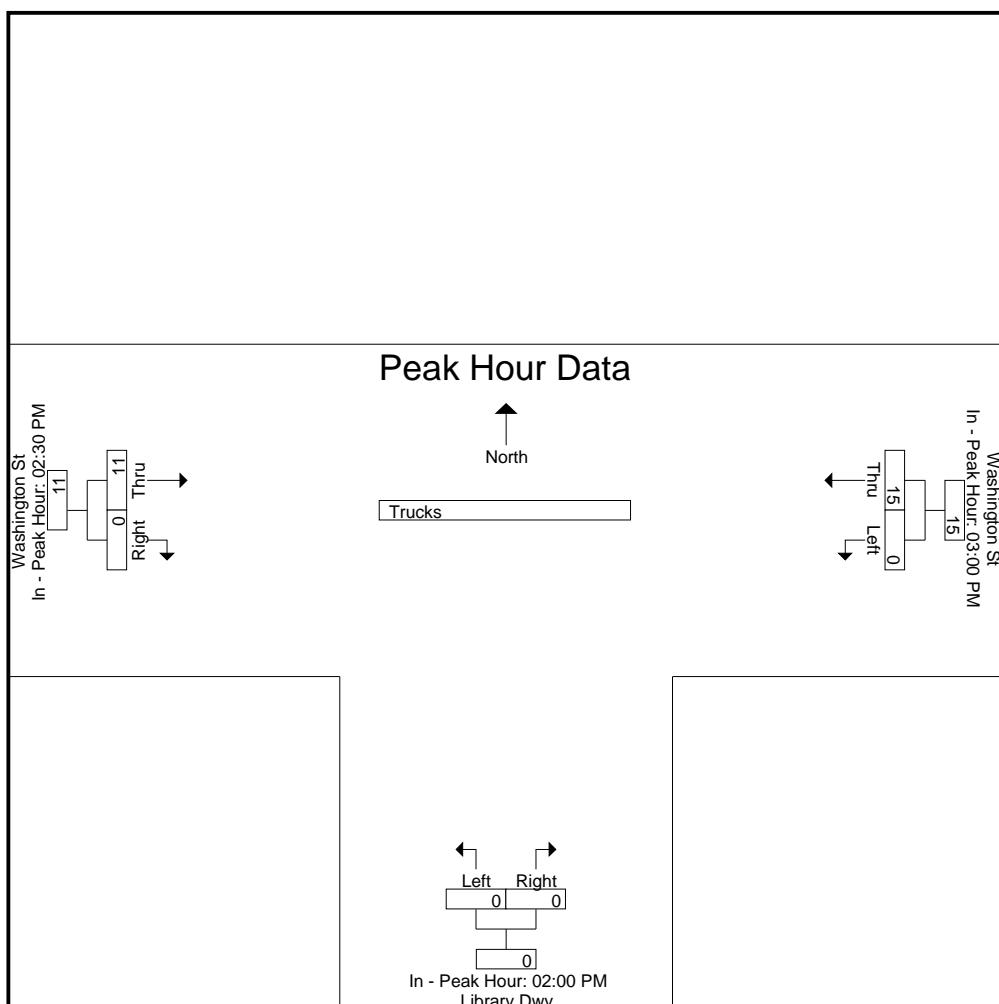
File Name : 547J00R3  
 Site Code : 547J0003  
 Start Date : 10/4/2018  
 Page No : 9

	Washington St From East			Library Dwy From South			Washington St From West			Int. Total
	Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	03:00 PM	02:00 PM			02:30 PM			
+0 mins.	0	3	3	0	0	0	1	1
+15 mins.	0	4	4	0	0	0	4	4
+30 mins.	0	5	5	0	0	0	1	1
+45 mins.	0	3	3	0	0	0	5	5
Total Volume	0	15	15	0	0	0	11	11
% App. Total	0	100		0	0		100	0
PHF	.000	.750	.750	.000	.000	.000	.550	.550



**Accurate Counts**  
978-664-2565

N/S Street : Library Driveway  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

File Name : 547J00R3  
 Site Code : 547J0003  
 Start Date : 10/4/2018  
 Page No : 10

Groups Printed- Bikes Peds

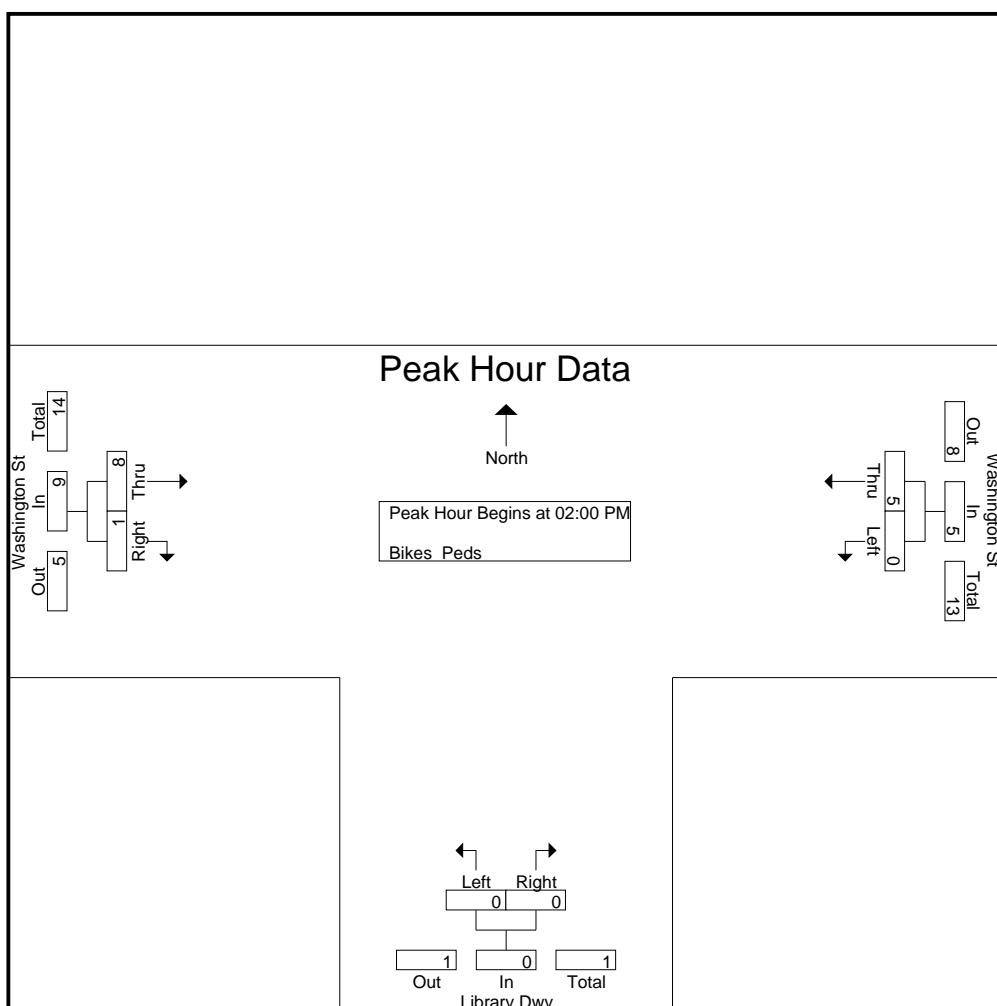
	Washington St From East			Library Dwy From South			Washington St From West						
	Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Excl. Total	Incl. Total	Int. Total
02:00 PM		0	0	0	0	0	4	2	0	1	5	2	7
02:15 PM		0	0	0	0	0	10	0	0	0	10	0	10
02:30 PM		0	4	0	0	0	2	2	0	1	3	6	9
02:45 PM		0	1	1	0	0	16	4	1	0	17	6	23
Total		0	5	1	0	0	32	8	1	2	35	14	49
03:00 PM		0	0	0	0	0	4	0	0	0	4	0	4
03:15 PM		0	0	0	0	0	4	0	0	1	5	0	5
03:30 PM		0	1	0	0	0	4	0	0	0	4	1	5
03:45 PM		0	0	0	2	0	3	0	0	1	4	2	6
Total		0	1	0	2	0	15	0	0	2	17	3	20
Grand Total		0	6	1	2	0	47	8	1	4	52	17	69
Apprch %		0	100		100	0		88.9	11.1				
Total %		0	35.3		11.8	0		47.1	5.9		75.4	24.6	

**Accurate Counts**  
978-664-2565

N/S Street : Library Driveway  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

File Name : 547J00R3  
 Site Code : 547J0003  
 Start Date : 10/4/2018  
 Page No : 11

	Washington St From East			Library Dwy From South			Washington St From West			Int. Total	
	Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1											
Peak Hour for Entire Intersection Begins at 02:00 PM											
02:00 PM	0	0	0	0	0	0	0	2	0	2	2
02:15 PM	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	4	4	0	0	0	0	2	0	2	6
02:45 PM	0	1	1	0	0	0	0	4	1	5	6
Total Volume	0	5	5	0	0	0	0	8	1	9	14
% App. Total	0	100		0	0			88.9	11.1		
PHF	.000	.313	.313	.000	.000	.000	.000	.500	.250	.450	.583



**Accurate Counts**  
978-664-2565

N/S Street : Library Driveway  
 E/W Street: Washington Street  
 City/State : Wellesley, MA  
 Weather : Clear

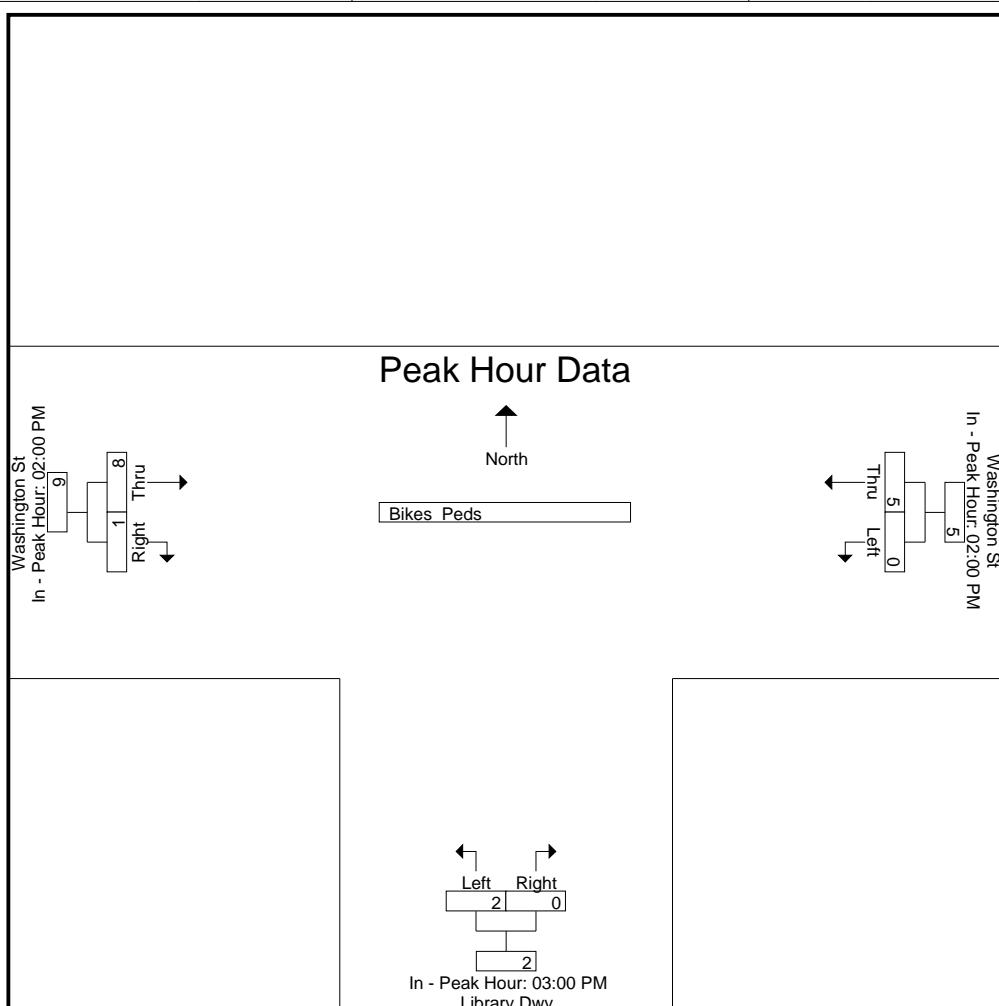
File Name : 547J00R3  
 Site Code : 547J0003  
 Start Date : 10/4/2018  
 Page No : 12

	Washington St From East			Library Dwy From South			Washington St From West			Int. Total
	Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	02:00 PM	03:00 PM			02:00 PM		
+0 mins.	0	0	0	0	0	2	0
+15 mins.	0	0	0	0	0	0	0
+30 mins.	0	4	4	0	0	2	0
+45 mins.	0	1	1	2	0	4	1
Total Volume	0	5	5	2	0	8	1
% App. Total	0	100		100	0	88.9	11.1
PHF	.000	.313	.313	.250	.000	.250	.500



**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Spring Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

File Name : 547J0004  
 Site Code : 547J0004  
 Start Date : 9/25/2018  
 Page No : 1

**Groups Printed- Cars - Trucks**

Start Time	Grove St From North		Spring St From East		Grove St From South		Int. Total
	Left	Thru	Left	Right	Thru	Right	
07:00 AM	1	18	5	3	21	9	57
07:15 AM	1	16	2	3	39	2	63
07:30 AM	4	29	4	0	31	8	76
07:45 AM	4	26	3	2	57	6	98
Total	10	89	14	8	148	25	294
08:00 AM	1	13	5	10	46	8	83
08:15 AM	2	15	19	21	34	8	99
08:30 AM	7	12	16	15	23	11	84
08:45 AM	4	14	3	5	34	7	67
Total	14	54	43	51	137	34	333
Grand Total	24	143	57	59	285	59	627
Apprch %	14.4	85.6	49.1	50.9	82.8	17.2	
Total %	3.8	22.8	9.1	9.4	45.5	9.4	
Cars	24	130	55	56	277	59	601
% Cars	100	90.9	96.5	94.9	97.2	100	95.9
Trucks	0	13	2	3	8	0	26
% Trucks	0	9.1	3.5	5.1	2.8	0	4.1

**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
E/W Street: Spring Street  
City/State : Wellesley, MA  
Weather : Cloudy

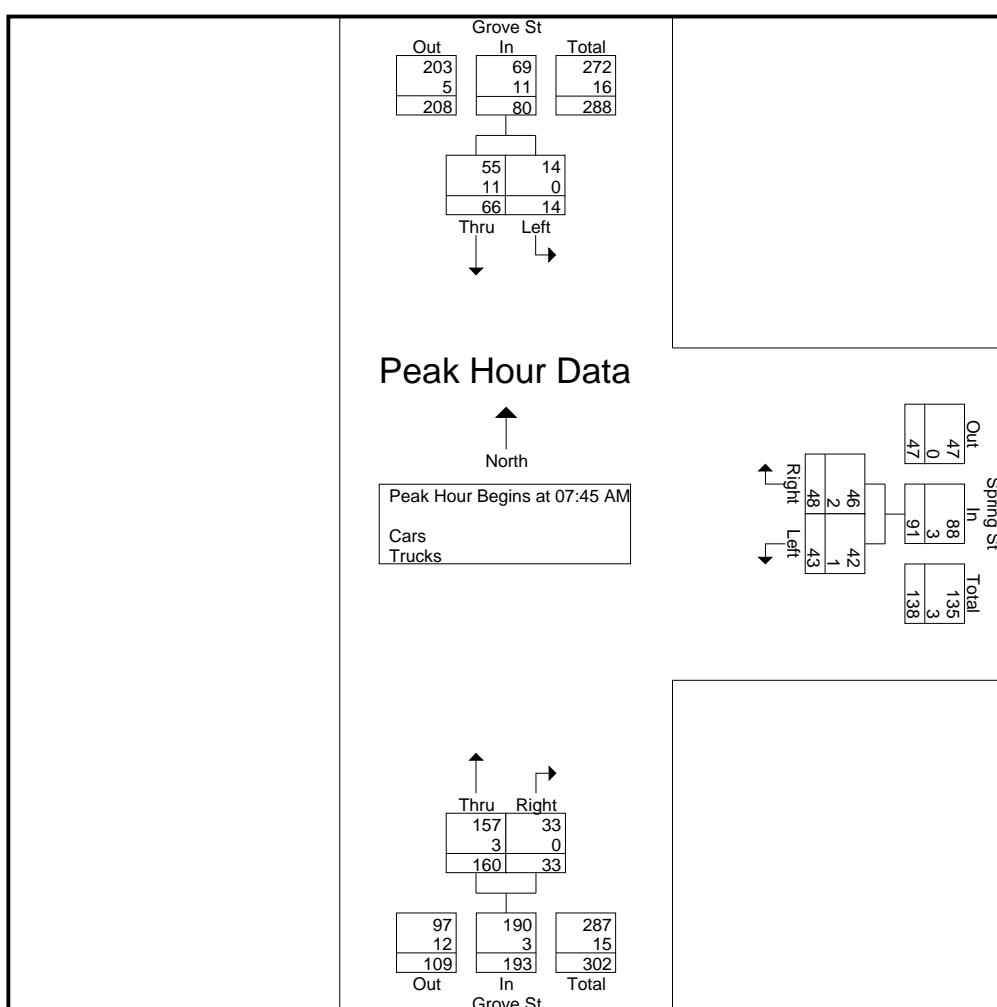
File Name : 547J0004  
Site Code : 547J0004  
Start Date : 9/25/2018  
Page No : 2

	Grove St			Spring St			Grove St			
	From North			From East			From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:45 AM

07:45 AM	4	26	30	3	2	5	57	6	63	98
08:00 AM	1	13	14	5	10	15	46	8	54	83
08:15 AM	2	15	17	19	21	40	34	8	42	99
08:30 AM	7	12	19	16	15	31	23	11	34	84
Total Volume	14	66	80	43	48	91	160	33	193	364
% App. Total	17.5	82.5		47.3	52.7		82.9	17.1		
PHF	.500	.635	.667	.566	.571	.569	.702	.750	.766	.919
Cars	14	55	69	42	46	88	157	33	190	347
% Cars	100	83.3	86.3	97.7	95.8	96.7	98.1	100	98.4	95.3
Trucks	0	11	11	1	2	3	3	0	3	17
% Trucks	0	16.7	13.8	2.3	4.2	3.3	1.9	0	1.6	4.7



**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
E/W Street: Spring Street  
City/State : Wellesley, MA  
Weather : Cloudy

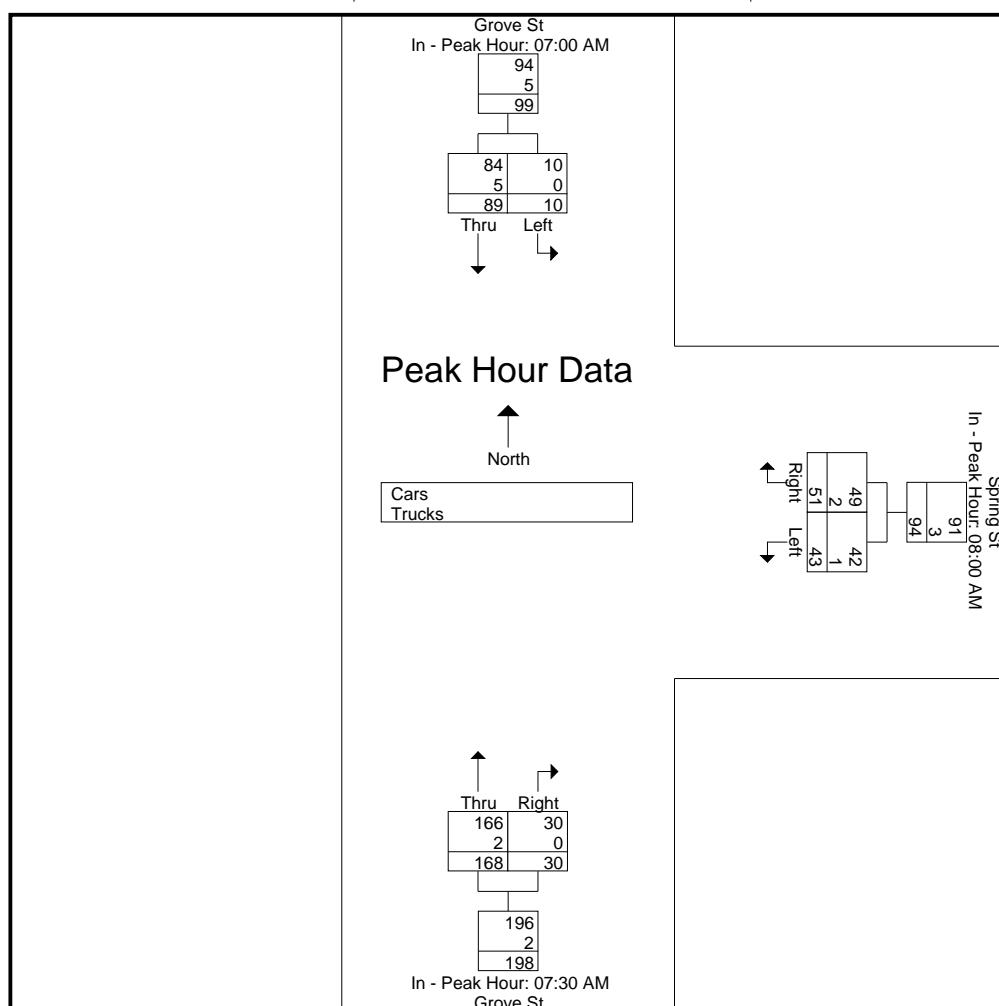
File Name : 547J0004  
Site Code : 547J0004  
Start Date : 9/25/2018  
Page No : 3

	Grove St From North			Spring St From East			Grove St From South			Int. Total
	Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM	08:00 AM			07:30 AM			
+0 mins.	1	18	19		5	10	15	31
+15 mins.	1	16	17		19	21	40	57
+30 mins.	4	29	33		16	15	31	46
+45 mins.	4	26	30		3	5	8	34
Total Volume	10	89	99		43	51	94	168
% App. Total	10.1	89.9			45.7	54.3		84.8
PHF	.625	.767	.750		.566	.607	.588	.737
Cars	10	84	94		42	49	91	166
% Cars	100	94.4	94.9		97.7	96.1	96.8	98.8
Trucks	0	5	5		1	2	3	2
% Trucks	0	5.6	5.1		2.3	3.9	3.2	1.2



**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Spring Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

File Name : 547J0004  
 Site Code : 547J0004  
 Start Date : 9/25/2018  
 Page No : 4

**Groups Printed- Cars**

	Grove St From North		Spring St From East		Grove St From South		Int. Total	
	Start Time	Left	Thru	Left	Right	Thru	Right	
07:00 AM		1	17	5	2	19	9	53
07:15 AM		1	15	2	3	38	2	61
07:30 AM		4	29	3	0	30	8	74
07:45 AM		4	23	3	2	56	6	94
Total		10	84	13	7	143	25	282
08:00 AM		1	10	4	9	46	8	78
08:15 AM		2	12	19	20	34	8	95
08:30 AM		7	10	16	15	21	11	80
08:45 AM		4	14	3	5	33	7	66
Total		14	46	42	49	134	34	319
Grand Total		24	130	55	56	277	59	601
Apprch %		15.6	84.4	49.5	50.5	82.4	17.6	
Total %		4	21.6	9.2	9.3	46.1	9.8	

**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
E/W Street: Spring Street  
City/State : Wellesley, MA  
Weather : Cloudy

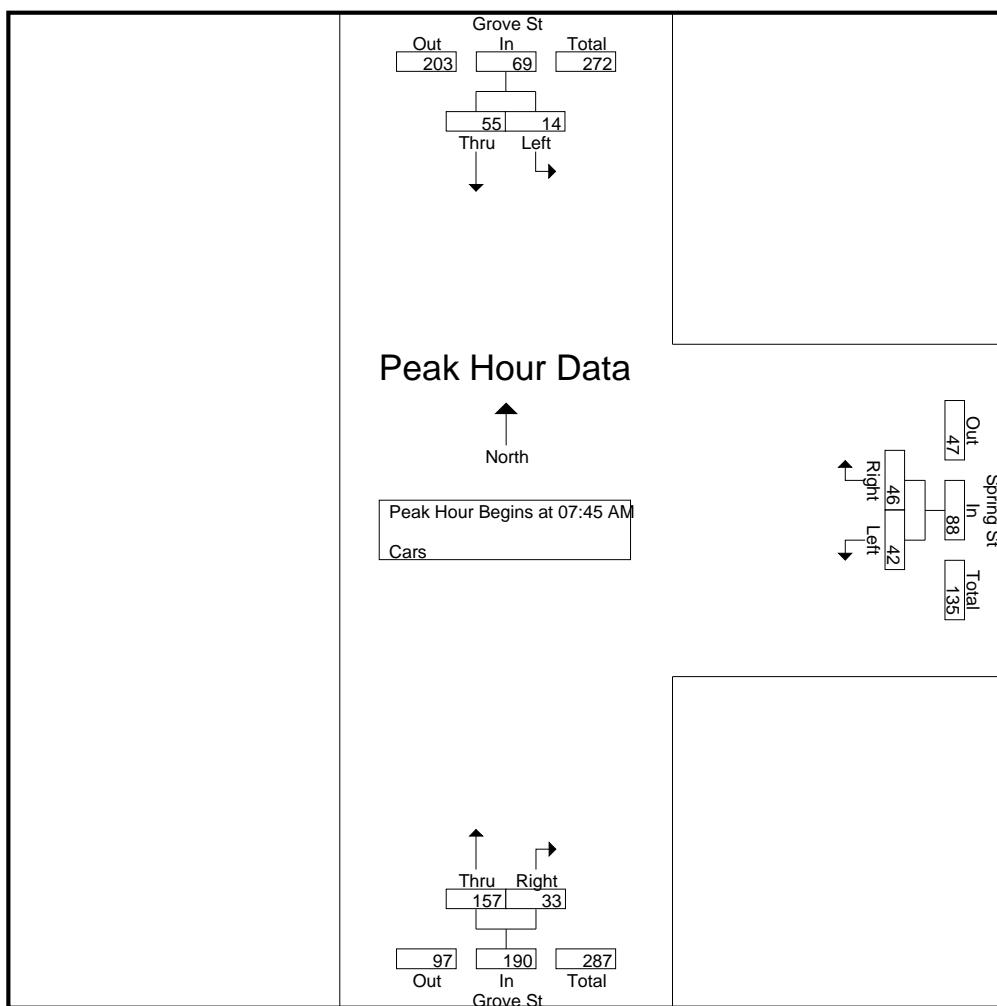
File Name : 547J0004  
Site Code : 547J0004  
Start Date : 9/25/2018  
Page No : 5

	Grove St			Spring St			Grove St			
	From North			From East			From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:45 AM

07:45 AM	4	23	27	3	2	5	56	6	62	94
08:00 AM	1	10	11	4	9	13	46	8	54	78
08:15 AM	2	12	14	19	20	39	34	8	42	95
08:30 AM	7	10	17	16	15	31	21	11	32	80
Total Volume	14	55	69	42	46	88	157	33	190	347
% App. Total	20.3	79.7		47.7	52.3		82.6	17.4		
PHF	.500	.598	.639	.553	.575	.564	.701	.750	.766	.913



**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
E/W Street: Spring Street  
City/State : Wellesley, MA  
Weather : Cloudy

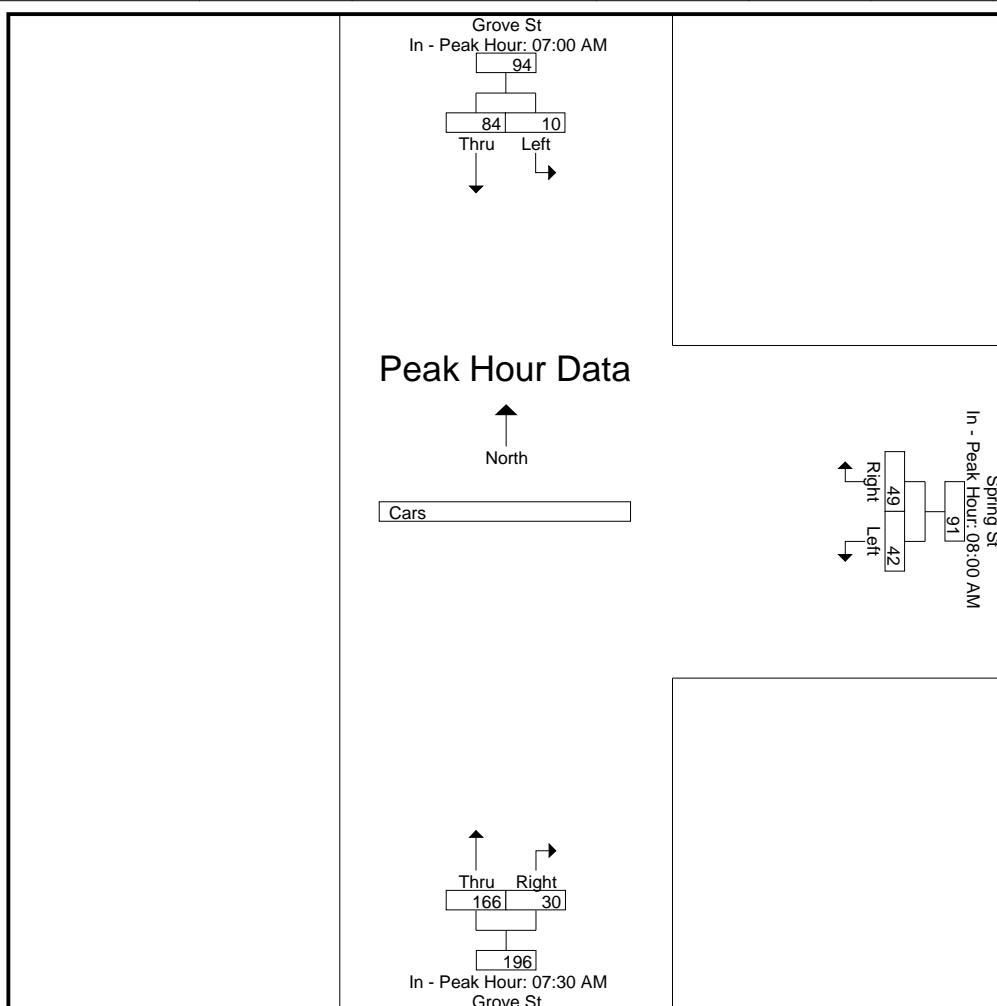
File Name : 547J0004  
Site Code : 547J0004  
Start Date : 9/25/2018  
Page No : 6

	Grove St			Spring St			Grove St			
	From North			From East			From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM	08:00 AM			07:30 AM		
+0 mins.	1	17	18	4	9	13	30
+15 mins.	1	15	16	19	20	39	56
+30 mins.	4	29	33	16	15	31	46
+45 mins.	4	23	27	3	5	8	34
Total Volume	10	84	94	42	49	91	166
% App. Total	10.6	89.4		46.2	53.8		84.7
PHF	.625	.724	.712	.553	.613	.583	.741
							.938
							.790



**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Spring Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

File Name : 547J0004  
 Site Code : 547J0004  
 Start Date : 9/25/2018  
 Page No : 7

**Groups Printed- Trucks**

	Grove St From North		Spring St From East		Grove St From South		Int. Total	
	Start Time	Left	Thru	Left	Right	Thru	Right	
07:00 AM		0	1	0	1	2	0	4
07:15 AM		0	1	0	0	1	0	2
07:30 AM		0	0	1	0	1	0	2
07:45 AM		0	3	0	0	1	0	4
Total		0	5	1	1	5	0	12
08:00 AM		0	3	1	1	0	0	5
08:15 AM		0	3	0	1	0	0	4
08:30 AM		0	2	0	0	2	0	4
08:45 AM		0	0	0	0	1	0	1
Total		0	8	1	2	3	0	14
Grand Total		0	13	2	3	8	0	26
Apprch %		0	100	40	60	100	0	
Total %		0	50	7.7	11.5	30.8	0	

**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
E/W Street: Spring Street  
City/State : Wellesley, MA  
Weather : Cloudy

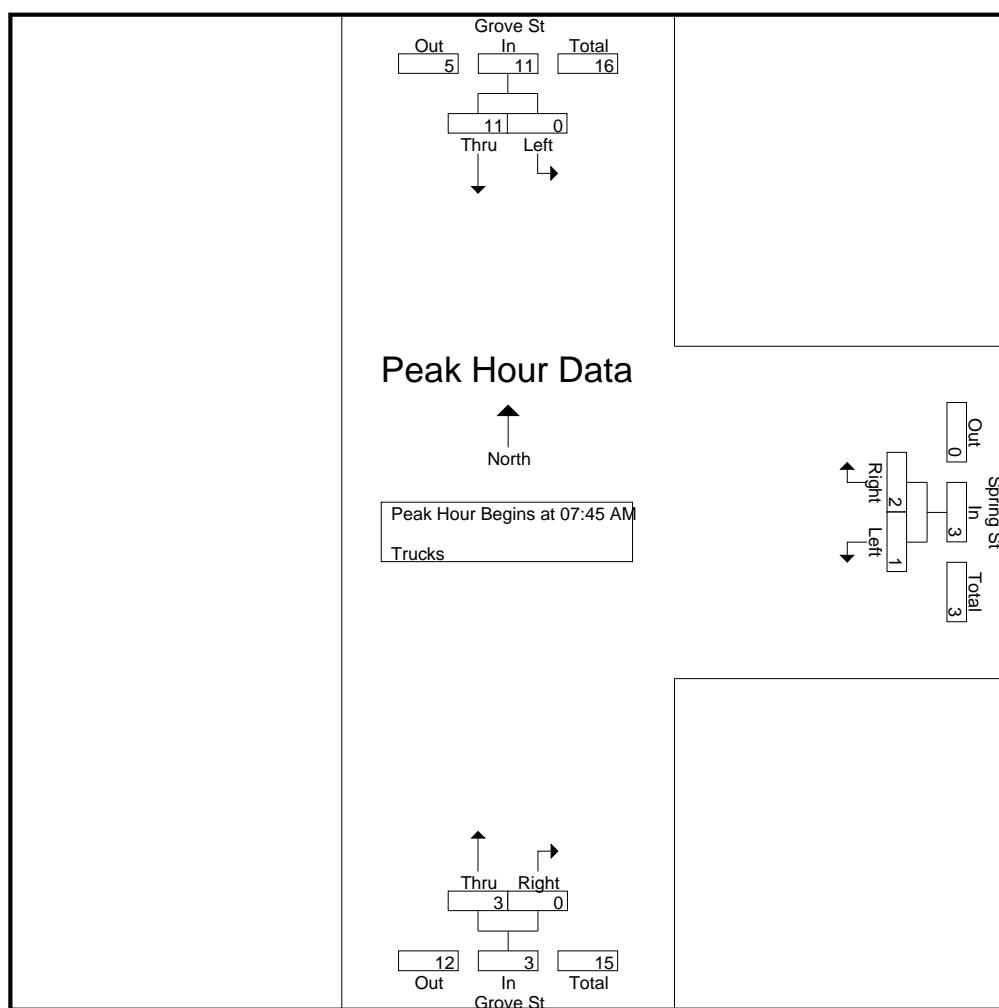
File Name : 547J0004  
Site Code : 547J0004  
Start Date : 9/25/2018  
Page No : 8

	Grove St			Spring St			Grove St			
	From North			From East			From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:45 AM

07:45 AM	0	3	3	0	0	0	1	0	1	4
08:00 AM	0	3	3	1	1	2	0	0	0	5
08:15 AM	0	3	3	0	1	1	0	0	0	4
08:30 AM	0	2	2	0	0	0	2	0	2	4
Total Volume	0	11	11	1	2	3	3	0	3	17
% App. Total	0	100		33.3	66.7		100	0		
PHF	.000	.917	.917	.250	.500	.375	.375	.000	.375	.850



**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Spring Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

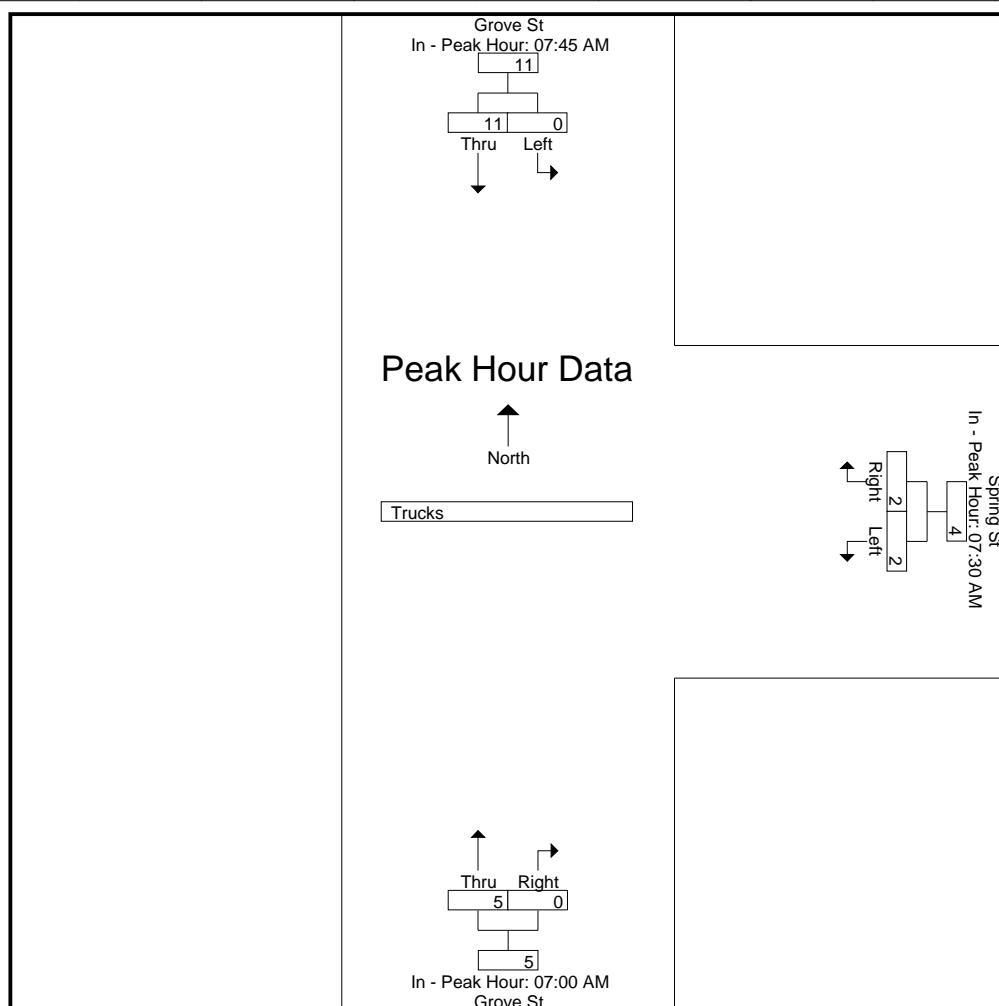
File Name : 547J0004  
 Site Code : 547J0004  
 Start Date : 9/25/2018  
 Page No : 9

	Grove St From North			Spring St From East			Grove St From South			Int. Total
	Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:45 AM		07:30 AM		07:00 AM	
+0 mins.	0	3	3	1	0	1
+15 mins.	0	3	3	0	0	0
+30 mins.	0	3	3	1	1	2
+45 mins.	0	2	2	0	1	1
Total Volume	0	11	11	2	2	4
% App. Total	0	100		50	50	
PHF	.000	.917	.917	.500	.500	.500



**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Spring Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

File Name : 547J0004  
 Site Code : 547J0004  
 Start Date : 9/25/2018  
 Page No : 10

**Groups Printed- Bikes Peds**

	Grove St From North			Spring St From East			Grove St From South						
	Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Excl. Total	Incl. Total	Int. Total
07:00 AM		0	0	0	0	0	0	1	0	0	0	1	1
07:15 AM		0	0	2	0	0	3	0	0	0	5	0	5
07:30 AM		1	0	0	0	0	2	0	0	0	2	1	3
07:45 AM		0	0	0	0	0	1	0	0	0	1	0	1
Total		1	0	2	0	0	6	1	0	0	8	2	10
08:00 AM		1	0	6	0	0	5	0	0	1	12	1	13
08:15 AM		0	0	6	0	0	7	1	0	0	13	1	14
08:30 AM		0	0	1	0	0	3	0	0	3	7	0	7
08:45 AM		0	0	2	0	0	5	0	0	2	9	0	9
Total		1	0	15	0	0	20	1	0	6	41	2	43
Grand Total		2	0	17	0	0	26	2	0	6	49	4	53
Apprch %		100	0		0	0		100	0				
Total %		50	0		0	0		50	0		92.5	7.5	

**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
E/W Street: Spring Street  
City/State : Wellesley, MA  
Weather : Cloudy

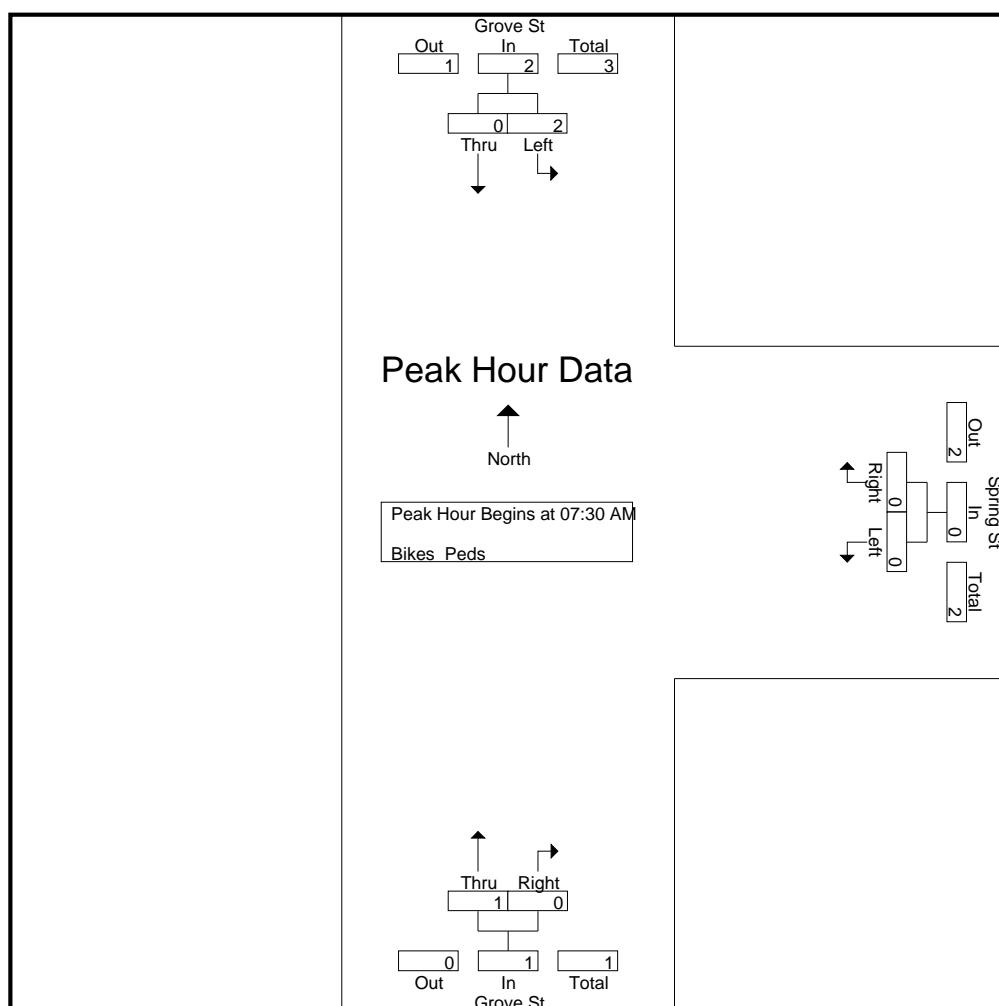
File Name : 547J0004  
Site Code : 547J0004  
Start Date : 9/25/2018  
Page No : 11

	Grove St			Spring St			Grove St			
	From North			From East			From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:30 AM

07:30 AM	1	0	1	0	0	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0
08:00 AM	1	0	1	0	0	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	1	0	1	1
Total Volume	2	0	2	0	0	0	1	0	1	3
% App. Total	100	0		0	0		100	0		
PHF	.500	.000	.500	.000	.000	.000	.250	.000	.250	.750



**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Spring Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

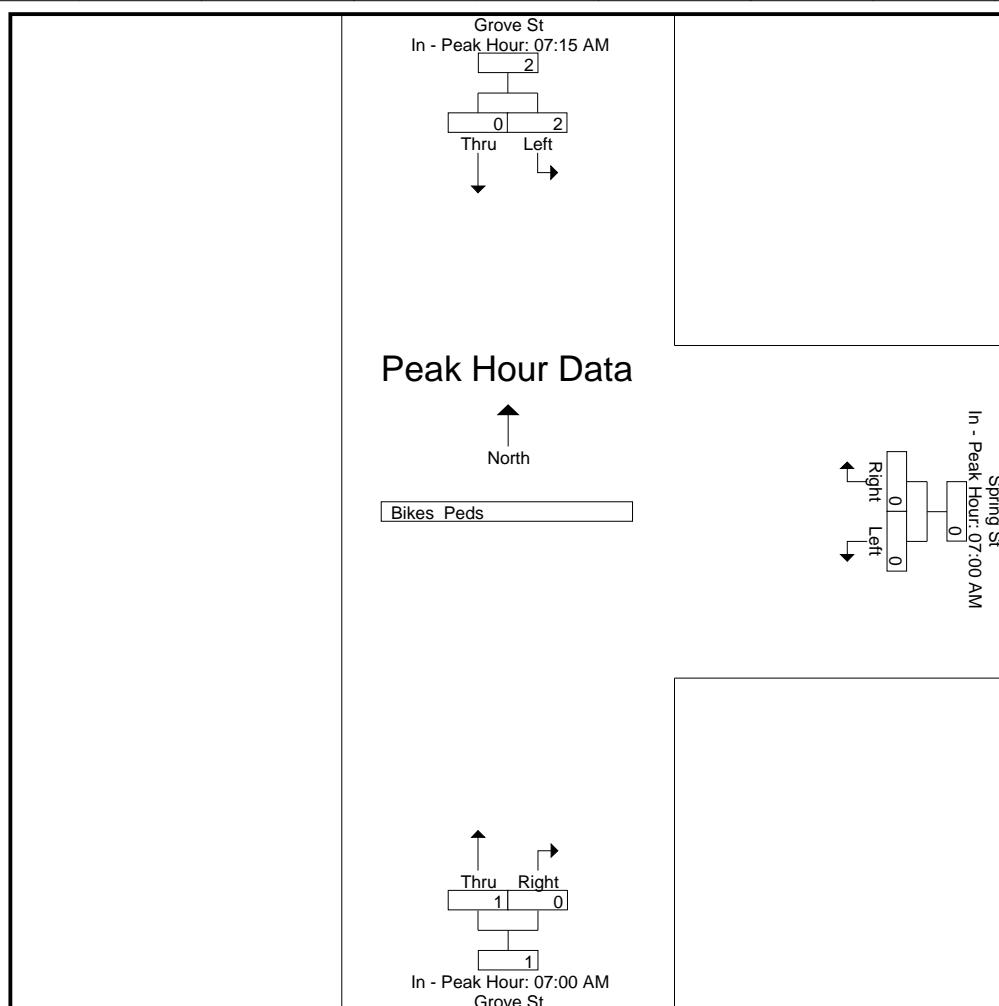
File Name : 547J0004  
 Site Code : 547J0004  
 Start Date : 9/25/2018  
 Page No : 12

	Grove St From North			Spring St From East			Grove St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:15 AM		07:00 AM		07:00 AM	
+0 mins.	0	0	0	0	0	0
+15 mins.	1	0	1	0	0	0
+30 mins.	0	0	0	0	0	0
+45 mins.	1	0	1	0	0	0
Total Volume	2	0	2	0	0	0
% App. Total	100	0		0	0	100
PHF	.500	.000	.500	.000	.000	.000



**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Spring Street  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0004  
 Site Code : 547J0004  
 Start Date : 9/25/2018  
 Page No : 1

**Groups Printed- Cars - Trucks**

	Grove St From North		Spring St From East		Grove St From South		Int. Total	
	Start Time	Left	Thru	Left	Right	Thru	Right	
02:00 PM		2	28	6	17	33	3	89
02:15 PM		8	16	3	10	23	1	61
02:30 PM		4	27	6	10	31	5	83
02:45 PM		1	23	5	13	20	7	69
Total		15	94	20	50	107	16	302
03:00 PM		3	30	28	19	27	2	109
03:15 PM		2	25	36	20	32	5	120
03:30 PM		1	30	9	13	35	8	96
03:45 PM		4	29	3	18	24	3	81
Total		10	114	76	70	118	18	406
Grand Total		25	208	96	120	225	34	708
Apprch %		10.7	89.3	44.4	55.6	86.9	13.1	
Total %		3.5	29.4	13.6	16.9	31.8	4.8	
Cars		24	206	94	119	223	34	700
% Cars		96	99	97.9	99.2	99.1	100	98.9
Trucks		1	2	2	1	2	0	8
% Trucks		4	1	2.1	0.8	0.9	0	1.1

**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Spring Street  
 City/State : Wellesley, MA  
 Weather : Rain

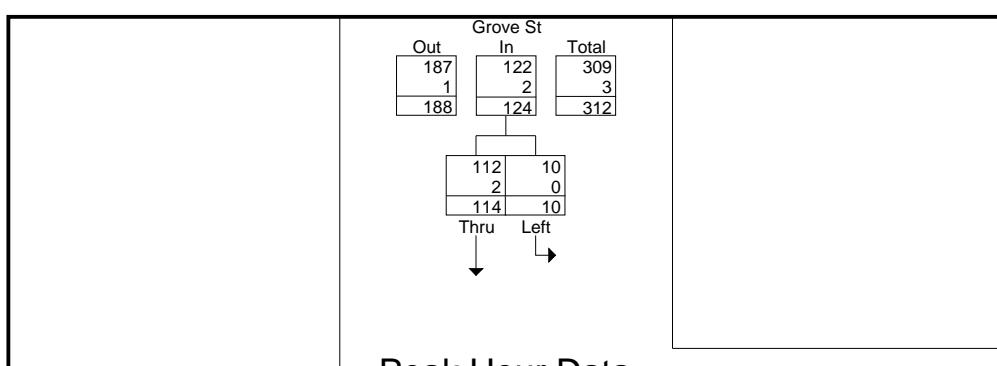
File Name : 547J0004  
 Site Code : 547J0004  
 Start Date : 9/25/2018  
 Page No : 2

	Grove St From North			Spring St From East			Grove St From South			Int. Total
	Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total

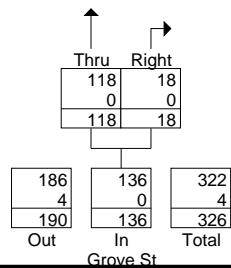
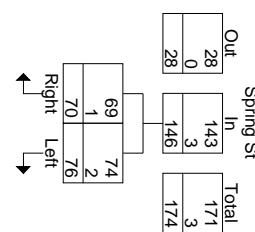
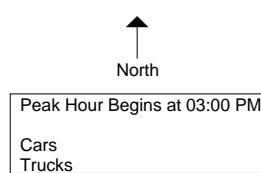
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 03:00 PM

03:00 PM	3	30	33	28	19	47	27	2	29	109
03:15 PM	2	25	27	36	20	56	32	5	37	120
03:30 PM	1	30	31	9	13	22	35	8	43	96
03:45 PM	4	29	33	3	18	21	24	3	27	81
Total Volume	10	114	124	76	70	146	118	18	136	406
% App. Total	8.1	91.9		52.1	47.9		86.8	13.2		
PHF	.625	.950	.939	.528	.875	.652	.843	.563	.791	.846
Cars	10	112	122	74	69	143	118	18	136	401
% Cars	100	98.2	98.4	97.4	98.6	97.9	100	100	100	98.8
Trucks	0	2	2	2	1	3	0	0	0	5
% Trucks	0	1.8	1.6	2.6	1.4	2.1	0	0	0	1.2



**Peak Hour Data**



**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
E/W Street: Spring Street  
City/State : Wellesley, MA  
Weather : Rain

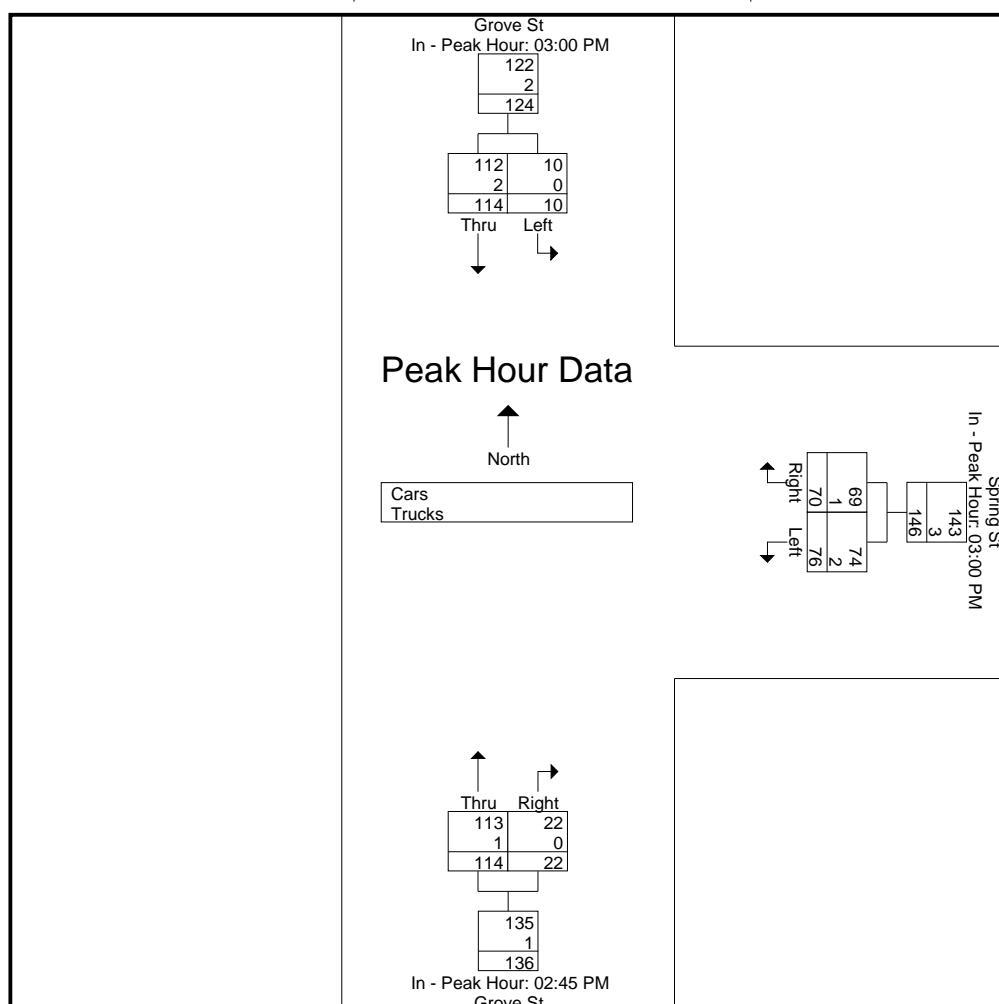
File Name : 547J0004  
Site Code : 547J0004  
Start Date : 9/25/2018  
Page No : 3

	Grove St From North			Spring St From East			Grove St From South			Int. Total
	Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	03:00 PM			03:00 PM			02:45 PM			
+0 mins.	3	30	33	28	19	47	20	7	27	
+15 mins.	2	25	27	36	20	56	27	2	29	
+30 mins.	1	30	31	9	13	22	32	5	37	
+45 mins.	4	29	33	3	18	21	35	8	43	
Total Volume	10	114	124	76	70	146	114	22	136	
% App. Total	8.1	91.9		52.1	47.9		83.8	16.2		
PHF	.625	.950	.939	.528	.875	.652	.814	.688	.791	
Cars	10	112	122	74	69	143	113	22	135	
% Cars	100	98.2	98.4	97.4	98.6	97.9	99.1	100	99.3	
Trucks	0	2	2	2	1	3	1	0	1	
% Trucks	0	1.8	1.6	2.6	1.4	2.1	0.9	0	0.7	



**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Spring Street  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0004  
 Site Code : 547J0004  
 Start Date : 9/25/2018  
 Page No : 4

**Groups Printed- Cars**

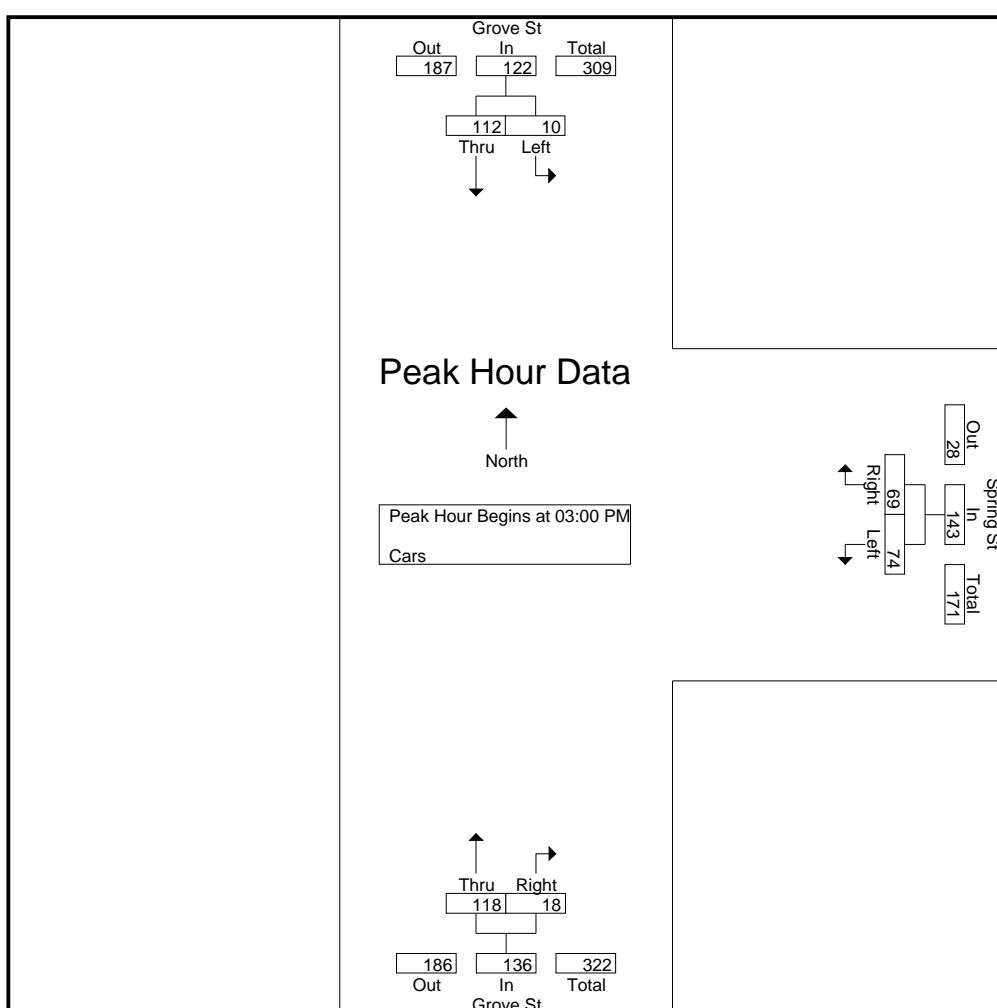
	Grove St From North		Spring St From East		Grove St From South		Int. Total	
	Start Time	Left	Thru	Left	Right	Thru	Right	
02:00 PM		2	28	6	17	32	3	88
02:15 PM		7	16	3	10	23	1	60
02:30 PM		4	27	6	10	31	5	83
02:45 PM		1	23	5	13	19	7	68
Total		14	94	20	50	105	16	299
03:00 PM		3	29	27	19	27	2	107
03:15 PM		2	25	35	19	32	5	118
03:30 PM		1	30	9	13	35	8	96
03:45 PM		4	28	3	18	24	3	80
Total		10	112	74	69	118	18	401
Grand Total		24	206	94	119	223	34	700
Apprch %		10.4	89.6	44.1	55.9	86.8	13.2	
Total %		3.4	29.4	13.4	17	31.9	4.9	

**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Spring Street  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0004  
 Site Code : 547J0004  
 Start Date : 9/25/2018  
 Page No : 5

	Grove St From North			Spring St From East			Grove St From South			Int. Total	
	Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1											
Peak Hour for Entire Intersection Begins at 03:00 PM											
03:00 PM	3	29	<b>32</b>		27	<b>19</b>	46	27	2	29	107
03:15 PM	2	25	27		<b>35</b>	19	<b>54</b>	32	5	37	<b>118</b>
03:30 PM	1	<b>30</b>	31		9	13	22	<b>35</b>	<b>8</b>	<b>43</b>	96
03:45 PM	<b>4</b>	28	32		3	18	21	24	3	27	80
Total Volume	10	112	122		74	69	143	118	18	136	401
% App. Total	8.2	91.8			51.7	48.3		86.8	13.2		
PHF	.625	.933	.953		.529	.908	.662	.843	.563	.791	.850



**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
E/W Street: Spring Street  
City/State : Wellesley, MA  
Weather : Rain

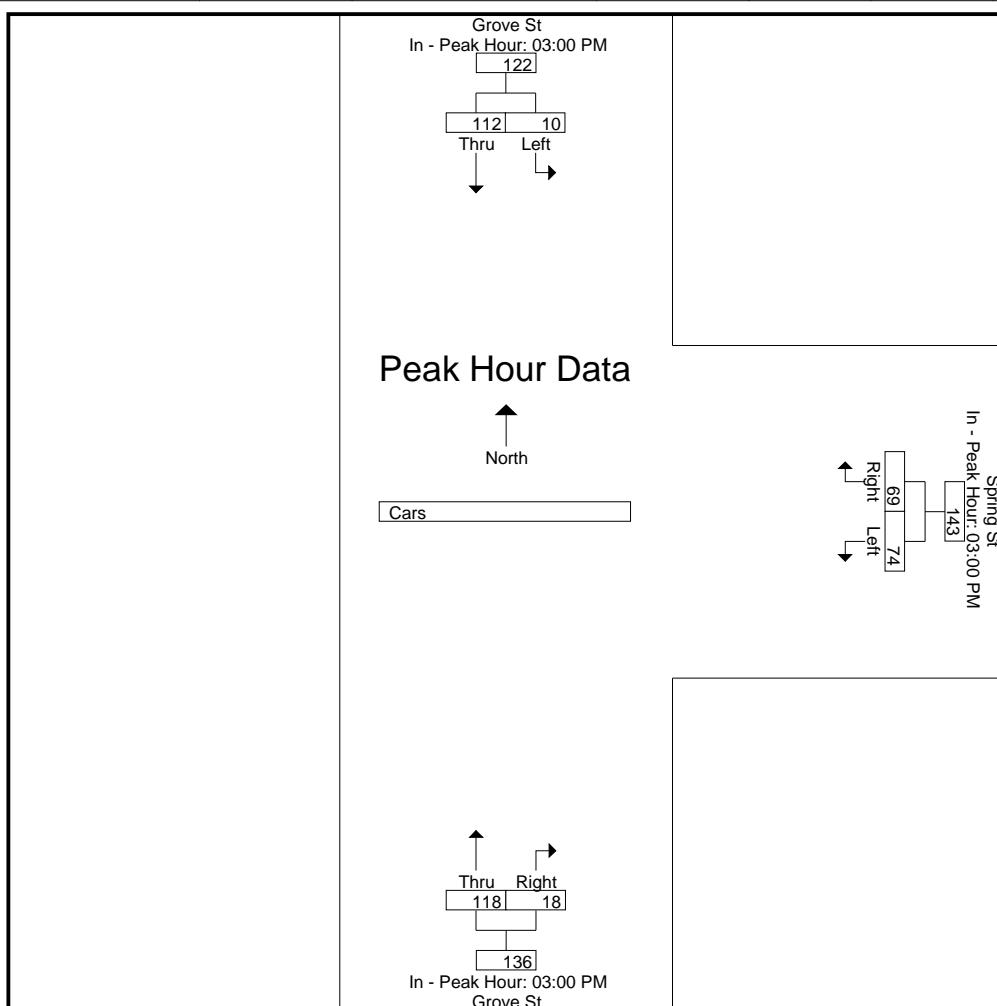
File Name : 547J0004  
Site Code : 547J0004  
Start Date : 9/25/2018  
Page No : 6

	Grove St			Spring St			Grove St			
	From North			From East			From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	03:00 PM			03:00 PM			03:00 PM		
+0 mins.	3	29	<b>32</b>	27	<b>19</b>	46	27	2	29
+15 mins.	2	25	27	<b>35</b>	19	<b>54</b>	32	5	37
+30 mins.	1	<b>30</b>	31	9	13	22	<b>35</b>	<b>8</b>	<b>43</b>
+45 mins.	<b>4</b>	28	32	3	18	21	24	3	27
Total Volume	10	112	122	74	69	143	118	18	136
% App. Total	8.2	91.8		51.7	48.3		86.8	13.2	
PHF	.625	.933	.953	.529	.908	.662	.843	.563	.791



**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Spring Street  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0004  
 Site Code : 547J0004  
 Start Date : 9/25/2018  
 Page No : 7

**Groups Printed- Trucks**

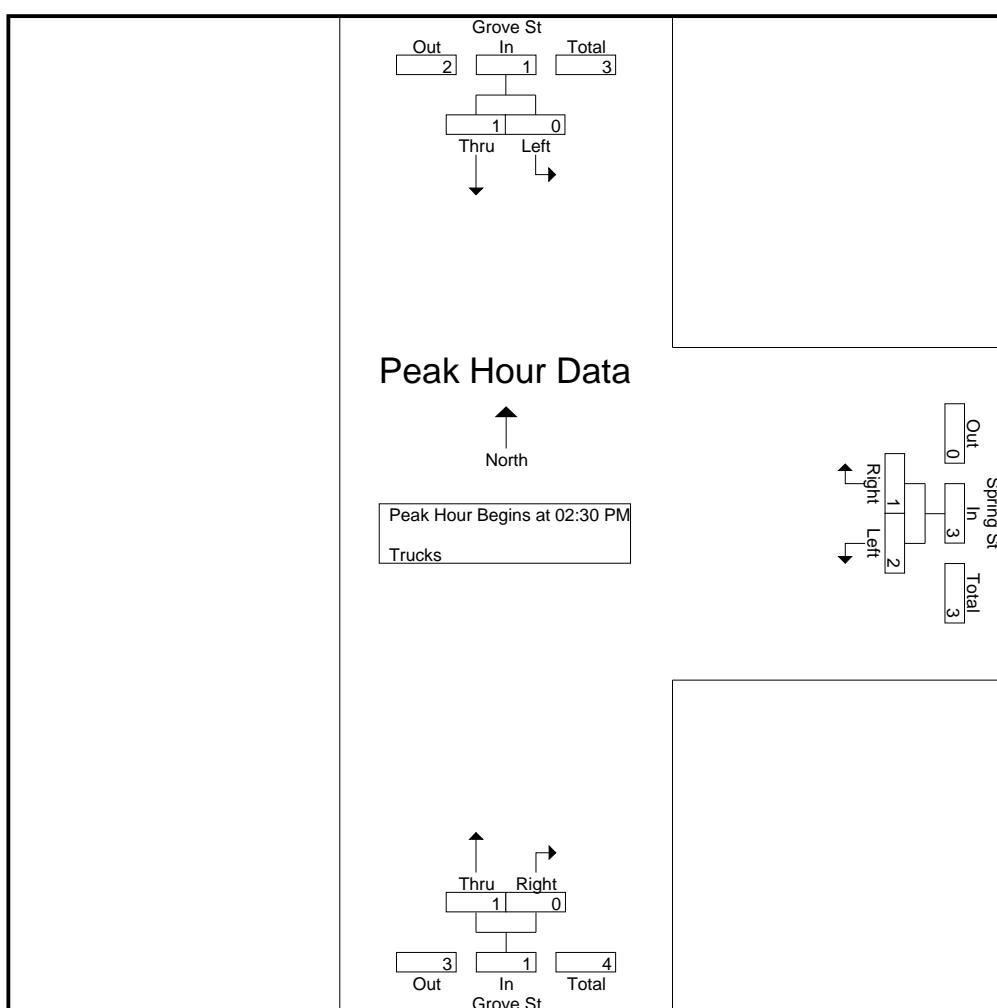
	Grove St From North		Spring St From East		Grove St From South		Int. Total	
	Start Time	Left	Thru	Left	Right	Thru	Right	
02:00 PM		0	0	0	0	1	0	1
02:15 PM		1	0	0	0	0	0	1
02:30 PM		0	0	0	0	0	0	0
02:45 PM		0	0	0	0	1	0	1
Total		1	0	0	0	2	0	3
03:00 PM		0	1	1	0	0	0	2
03:15 PM		0	0	1	1	0	0	2
03:30 PM		0	0	0	0	0	0	0
03:45 PM		0	1	0	0	0	0	1
Total		0	2	2	1	0	0	5
Grand Total		1	2	2	1	2	0	8
Apprch %	33.3	66.7	66.7	33.3	100	0		
Total %	12.5	25	25	12.5	25	0		

**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Spring Street  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0004  
 Site Code : 547J0004  
 Start Date : 9/25/2018  
 Page No : 8

	Grove St From North			Spring St From East			Grove St From South			Int. Total
	Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:30 PM										
02:30 PM	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	1	0	1
03:00 PM	0	1	1	1	1	0	1	0	0	0
03:15 PM	0	0	0	1	1	1	2	0	0	0
Total Volume	0	1	1	2	1	1	3	1	0	1
% App. Total	0	100		66.7	33.3			100	0	
PHF	.000	.250	.250	.500	.250	.375	.375	.250	.000	.250
										.625



**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
E/W Street: Spring Street  
City/State : Wellesley, MA  
Weather : Rain

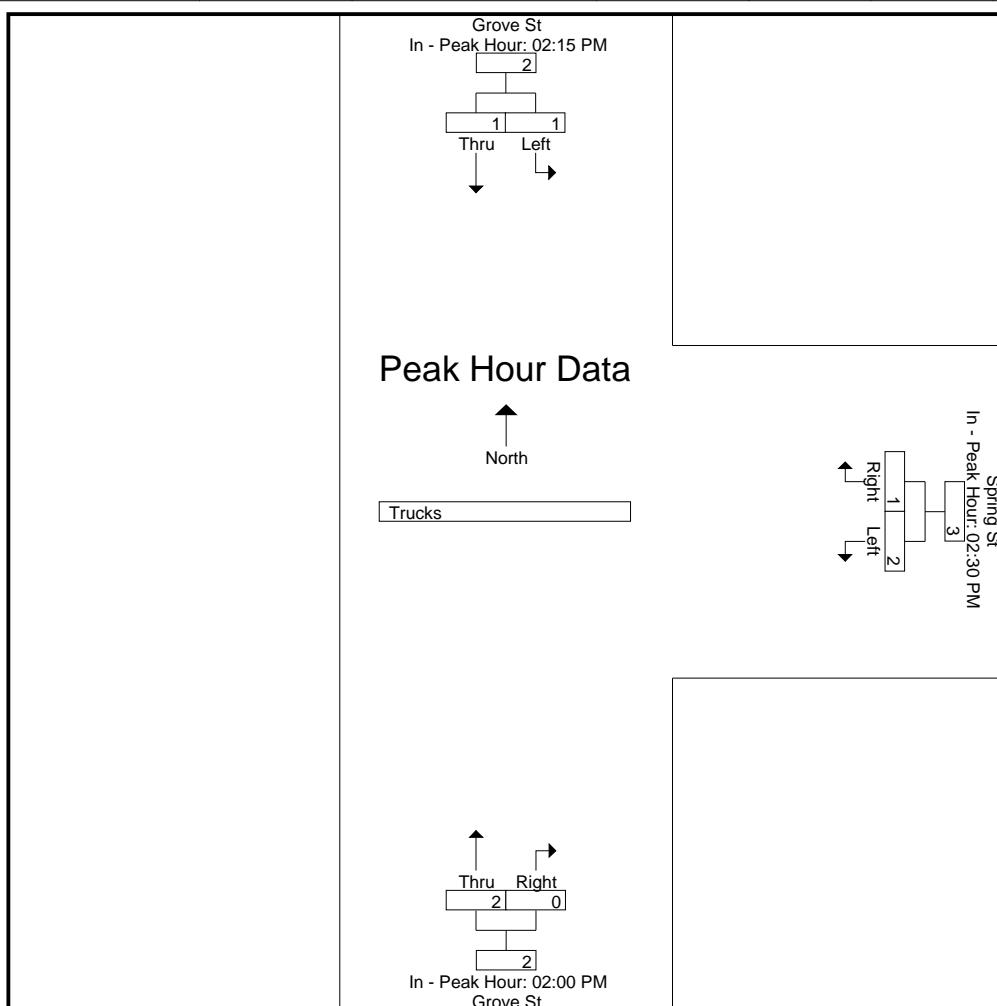
File Name : 547J0004  
Site Code : 547J0004  
Start Date : 9/25/2018  
Page No : 9

	Grove St From North			Spring St From East			Grove St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	02:15 PM		02:30 PM		02:00 PM				
+0 mins.	1	0	1	0	0	1			
+15 mins.	0	0	0	0	0	0			
+30 mins.	0	0	0	1	0	0			
+45 mins.	0	1	1	1	2	1			
Total Volume	1	1	2	2	1	3			
% App. Total	50	50		66.7	33.3				
PHF	.250	.250	.500	.500	.250	.375	.500	.000	.500



**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Spring Street  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0004  
 Site Code : 547J0004  
 Start Date : 9/25/2018  
 Page No : 10

**Groups Printed- Bikes Peds**

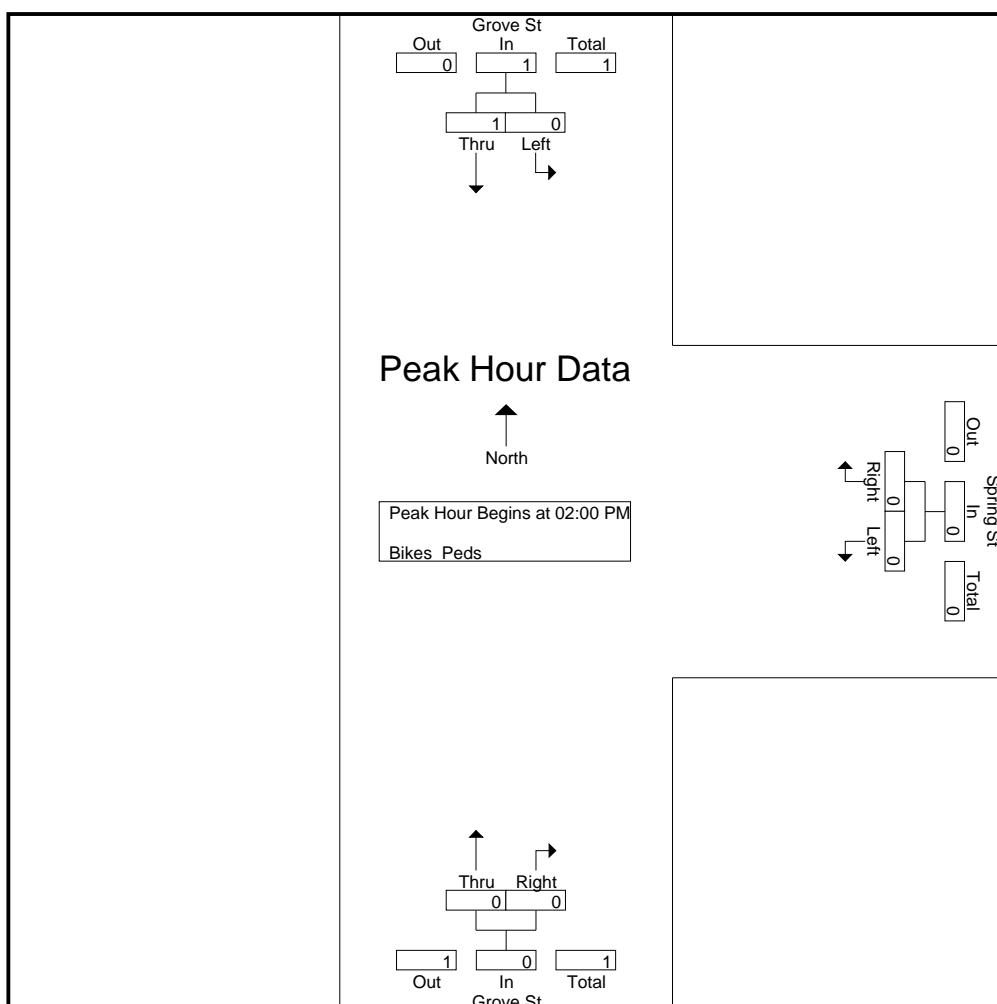
	Grove St From North			Spring St From East			Grove St From South						
	Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Excl. Total	Incl. Total	Int. Total
02:00 PM		0	0	5	0	0	12	0	0	3	20	0	20
02:15 PM		0	0	5	0	0	1	0	0	0	6	0	6
02:30 PM		0	0	3	0	0	4	0	0	3	10	0	10
02:45 PM		0	1	2	0	0	5	0	0	2	9	1	10
Total		0	1	15	0	0	22	0	0	8	45	1	46
03:00 PM		0	0	5	0	0	3	0	0	0	8	0	8
03:15 PM		0	0	1	0	0	5	0	0	0	6	0	6
03:30 PM		0	0	0	0	0	1	0	0	1	2	0	2
03:45 PM		0	0	6	0	0	1	0	0	2	9	0	9
Total		0	0	12	0	0	10	0	0	3	25	0	25
Grand Total		0	1	27	0	0	32	0	0	11	70	1	71
Apprch %		0	100		0	0		0	0				
Total %		0	100		0	0		0	0		98.6	1.4	

**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Spring Street  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0004  
 Site Code : 547J0004  
 Start Date : 9/25/2018  
 Page No : 11

	Grove St From North			Spring St From East			Grove St From South			Int. Total
	Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:00 PM										
02:00 PM	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	1	1	0	0	0	0	0	0	1
Total Volume	0	1	1	0	0	0	0	0	0	1
% App. Total	0	100		0	0		0	0		
PHF	.000	.250	.250	.000	.000	.000	.000	.000	.000	.250



**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
E/W Street: Spring Street  
City/State : Wellesley, MA  
Weather : Rain

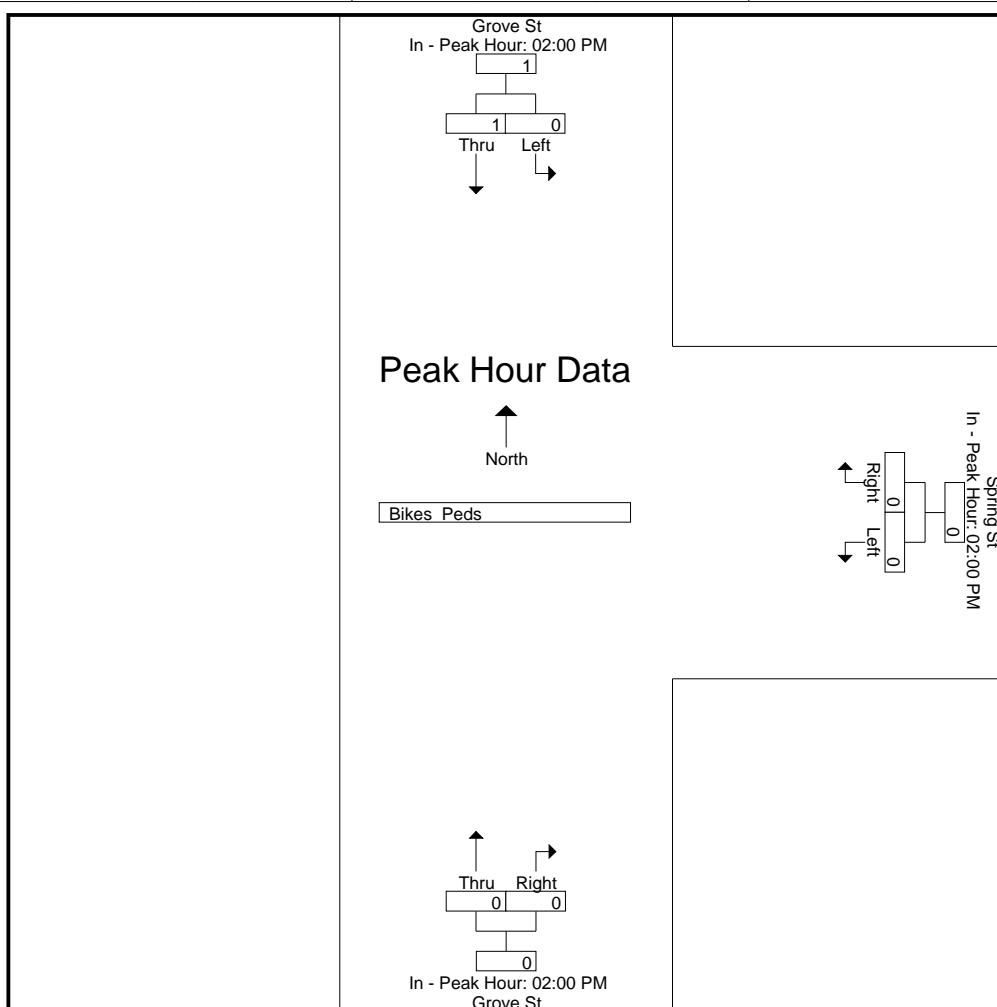
File Name : 547J0004  
Site Code : 547J0004  
Start Date : 9/25/2018  
Page No : 12

	Grove St			Spring St			Grove St			
	From North			From East			From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	02:00 PM	02:00 PM	02:00 PM
+0 mins.	0 0 0	0 0 0	0 0 0
+15 mins.	0 0 0	0 0 0	0 0 0
+30 mins.	0 0 0	0 0 0	0 0 0
+45 mins.	0 1 1	0 0 0	0 0 0
Total Volume	0 1 1	0 0 0	0 0 0
% App. Total	0 100	0 0	0 0
PHF	.000 .250 .250	.000 .000 .000	.000 .000 .000



**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

File Name : 547J0005  
 Site Code : 547J0005  
 Start Date : 9/25/2018  
 Page No : 1

**Groups Printed- Cars - Trucks**

	Grove St From North		Hampden St From East		Grove St From South		Int. Total	
	Start Time	Left	Thru	Left	Right	Thru	Right	
07:00 AM		10	13	8	1	27	31	90
07:15 AM		8	12	7	7	34	58	126
07:30 AM		14	16	18	6	26	57	137
07:45 AM		10	18	25	10	50	67	180
Total		42	59	58	24	137	213	533
08:00 AM		11	11	11	10	44	73	160
08:15 AM		6	24	14	7	30	102	183
08:30 AM		6	25	16	4	25	46	122
08:45 AM		5	8	13	7	29	30	92
Total		28	68	54	28	128	251	557
Grand Total		70	127	112	52	265	464	1090
Apprch %		35.5	64.5	68.3	31.7	36.4	63.6	
Total %		6.4	11.7	10.3	4.8	24.3	42.6	
Cars		67	121	112	51	257	460	1068
% Cars		95.7	95.3	100	98.1	97	99.1	98
Trucks		3	6	0	1	8	4	22
% Trucks		4.3	4.7	0	1.9	3	0.9	2

**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
E/W Street: Hamden Street  
City/State : Wellesley, MA  
Weather : Cloudy

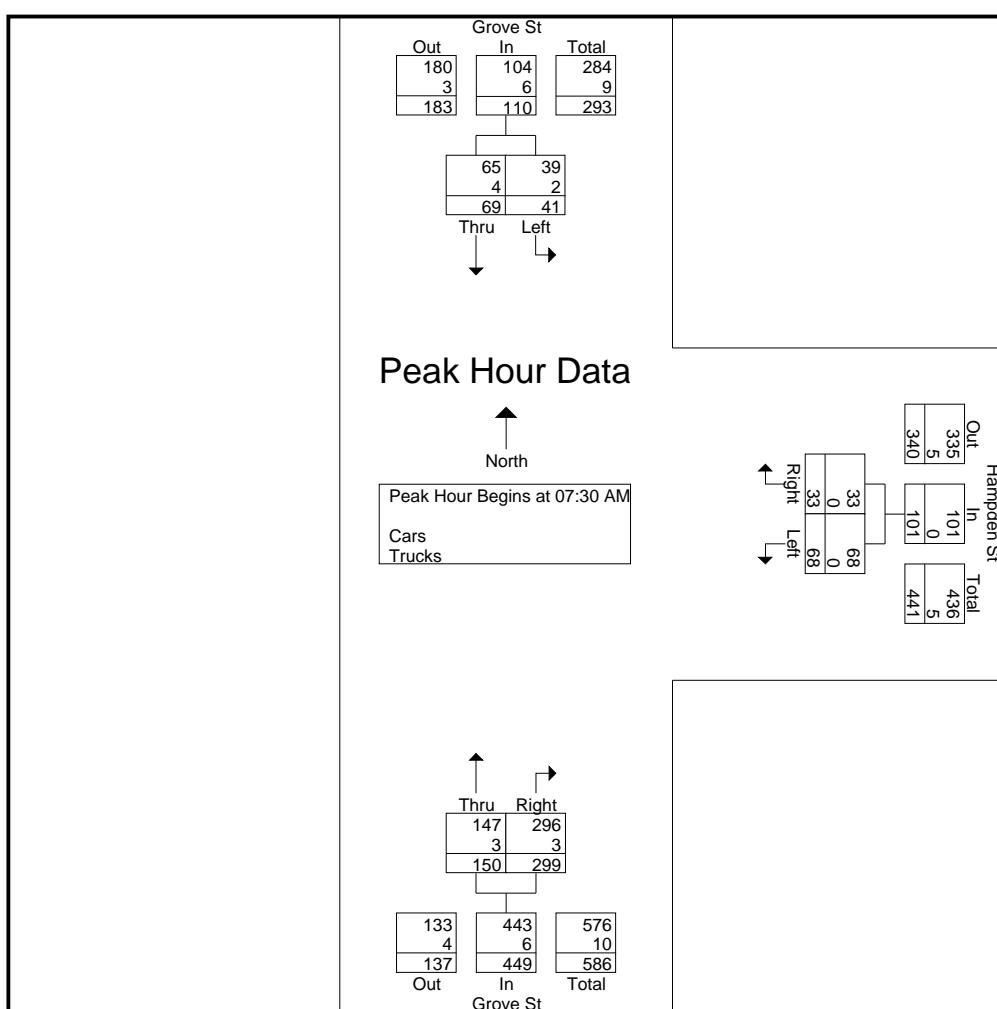
File Name : 547J0005  
Site Code : 547J0005  
Start Date : 9/25/2018  
Page No : 2

	Grove St			Hampden St			Grove St			
	From North			From East			From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:30 AM

07:30 AM	14	16	30	18	6	24	26	57	83	137
07:45 AM	10	18	28	25	10	35	50	67	117	180
08:00 AM	11	11	22	11	10	21	44	73	117	160
08:15 AM	6	24	30	14	7	21	30	102	132	183
Total Volume	41	69	110	68	33	101	150	299	449	660
% App. Total	37.3	62.7		67.3	32.7		33.4	66.6		
PHF	.732	.719	.917	.680	.825	.721	.750	.733	.850	.902
Cars	39	65	104	68	33	101	147	296	443	648
% Cars	95.1	94.2	94.5	100	100	100	98.0	99.0	98.7	98.2
Trucks	2	4	6	0	0	0	3	3	6	12
% Trucks	4.9	5.8	5.5	0	0	0	2.0	1.0	1.3	1.8



**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
E/W Street: Hamden Street  
City/State : Wellesley, MA  
Weather : Cloudy

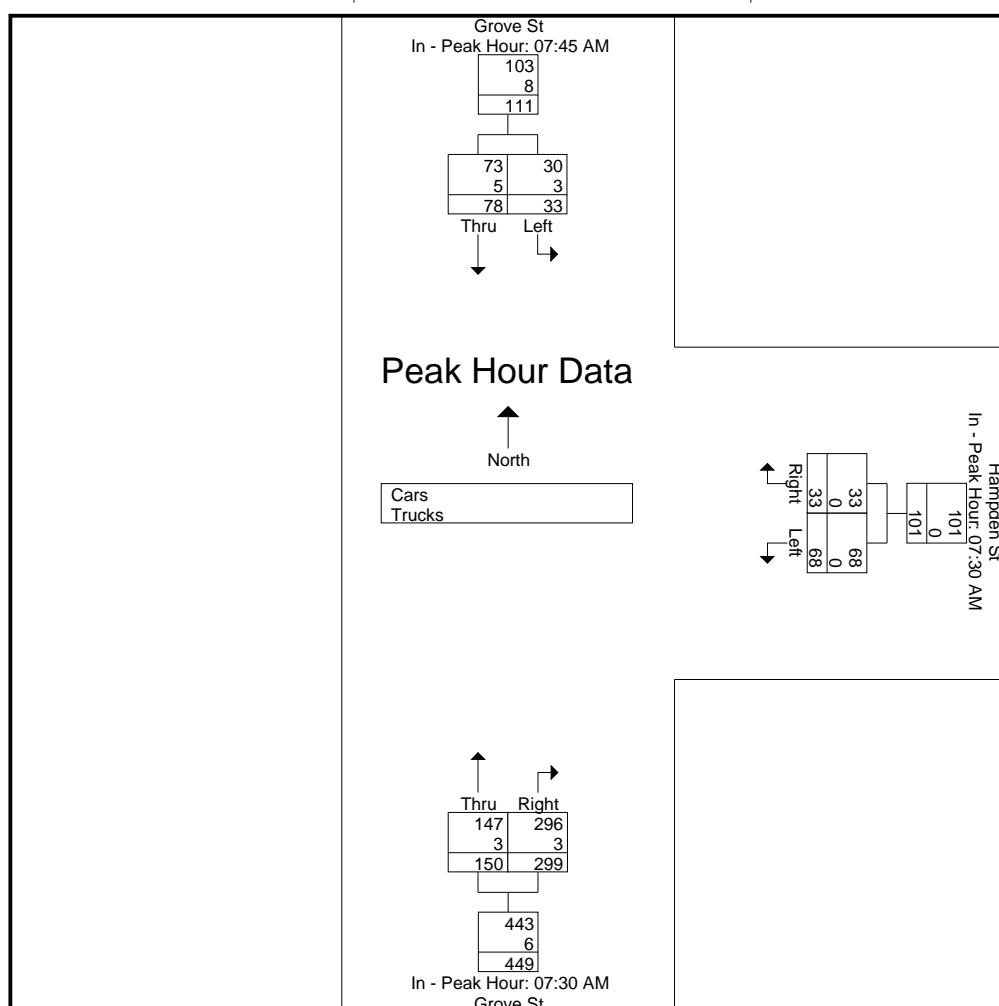
File Name : 547J0005  
Site Code : 547J0005  
Start Date : 9/25/2018  
Page No : 3

	Grove St			Hampden St			Grove St			
	From North			From East			From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:45 AM			07:30 AM			07:30 AM		
+0 mins.	10	18	28	18	6	24	26	57	83
+15 mins.	11	11	22	25	10	35	50	67	117
+30 mins.	6	24	30	11	10	21	44	73	117
+45 mins.	6	25	31	14	7	21	30	102	132
Total Volume	33	78	111	68	33	101	150	299	449
% App. Total	29.7	70.3		67.3	32.7		33.4	66.6	
PHF	.750	.780	.895	.680	.825	.721	.750	.733	.850
Cars	30	73	103	68	33	101	147	296	443
% Cars	90.9	93.6	92.8	100	100	100	98	99	98.7
Trucks	3	5	8	0	0	0	3	3	6
% Trucks	9.1	6.4	7.2	0	0	0	2	1	1.3



**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

File Name : 547J0005  
 Site Code : 547J0005  
 Start Date : 9/25/2018  
 Page No : 4

**Groups Printed- Cars**

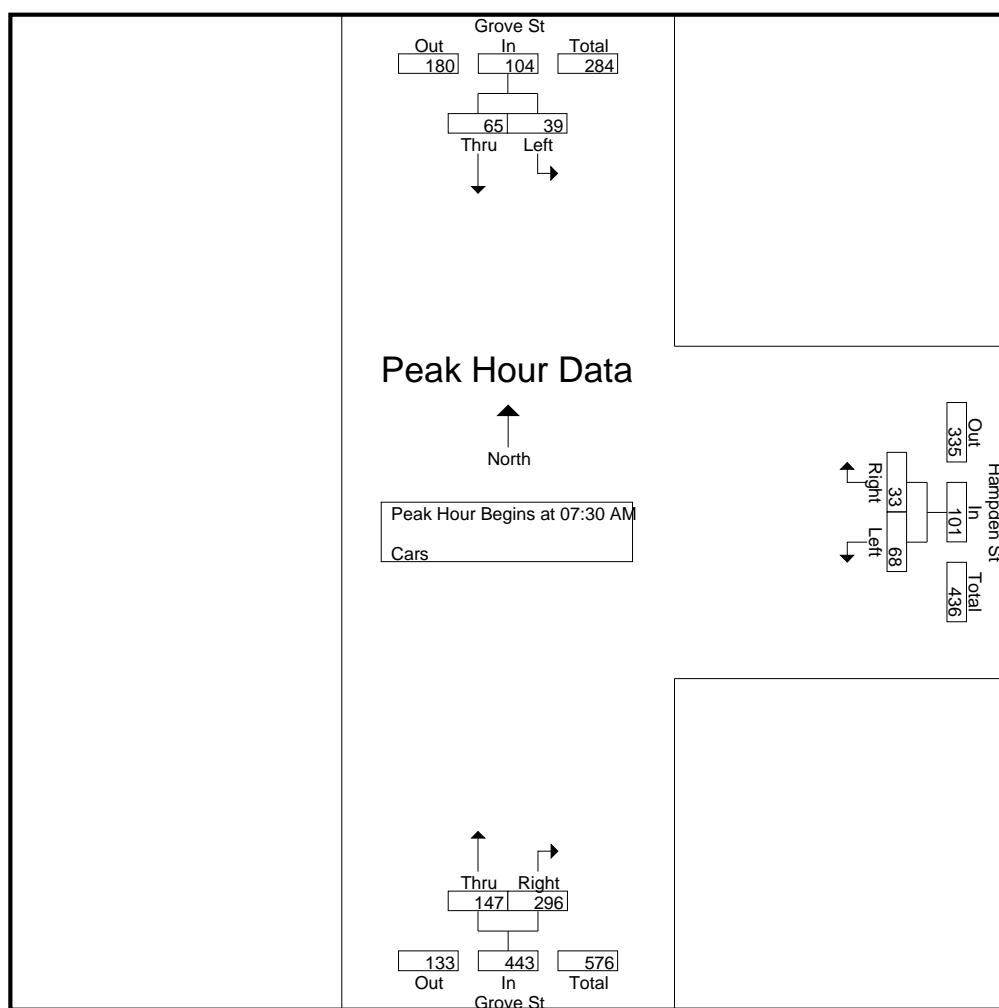
	Grove St From North		Hampden St From East		Grove St From South		Int. Total	
	Start Time	Left	Thru	Left	Right	Thru	Right	
07:00 AM		10	12	8	1	25	30	86
07:15 AM		8	12	7	7	33	58	125
07:30 AM		14	16	18	6	25	57	136
07:45 AM		10	16	25	10	49	66	176
Total		42	56	58	24	132	211	523
08:00 AM		9	10	11	10	43	71	154
08:15 AM		6	23	14	7	30	102	182
08:30 AM		5	24	16	4	24	46	119
08:45 AM		5	8	13	6	28	30	90
Total		25	65	54	27	125	249	545
Grand Total		67	121	112	51	257	460	1068
Apprch %		35.6	64.4	68.7	31.3	35.8	64.2	
Total %		6.3	11.3	10.5	4.8	24.1	43.1	

**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

File Name : 547J0005  
 Site Code : 547J0005  
 Start Date : 9/25/2018  
 Page No : 5

	Grove St			Hampden St			Grove St			
	From North			From East			From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	14	16	30	18	6	24	25	57	82	136
07:45 AM	10	16	26	25	10	35	49	66	115	176
08:00 AM	9	10	19	11	10	21	43	71	114	154
08:15 AM	6	23	29	14	7	21	30	102	132	182
Total Volume	39	65	104	68	33	101	147	296	443	648
% App. Total	37.5	62.5		67.3	32.7		33.2	66.8		
PHF	.696	.707	.867	.680	.825	.721	.750	.725	.839	.890



**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

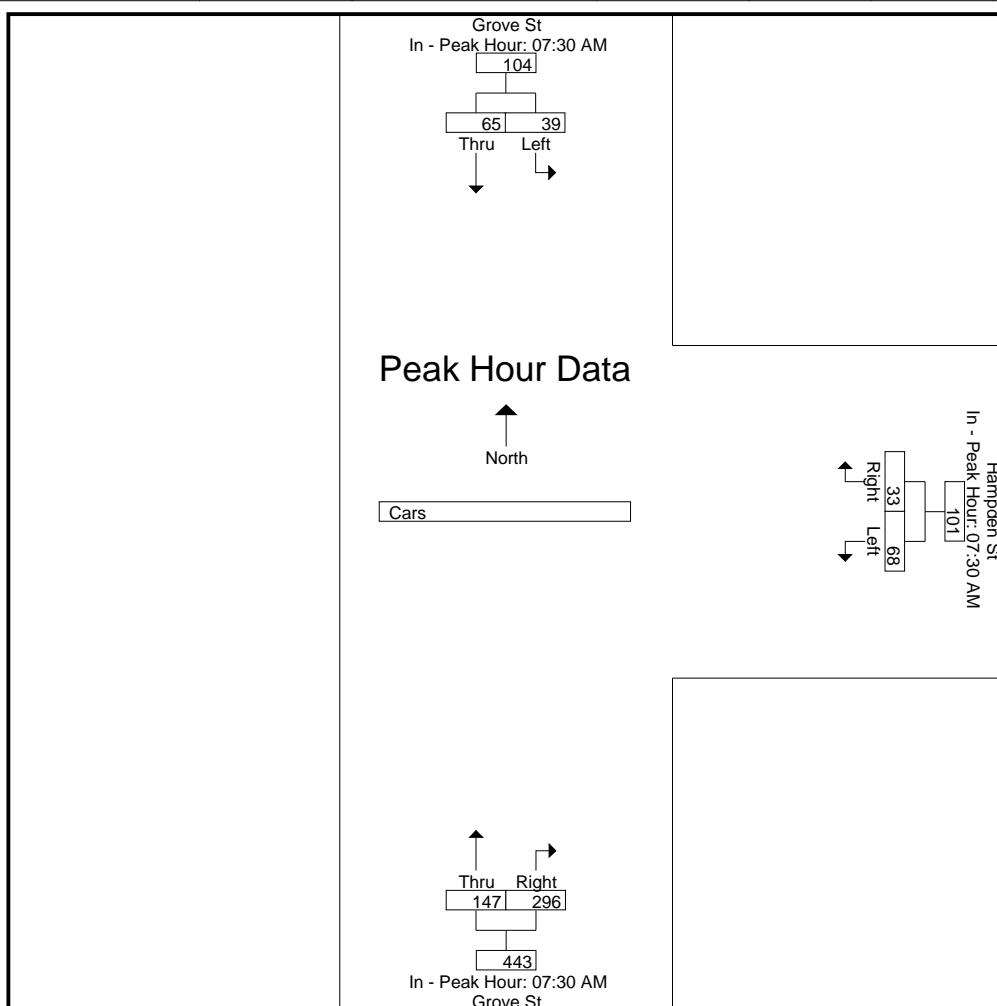
File Name : 547J0005  
 Site Code : 547J0005  
 Start Date : 9/25/2018  
 Page No : 6

	Grove St From North			Hampden St From East			Grove St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:30 AM			07:30 AM			07:30 AM			
+0 mins.	14	16	30	18	6	24	25	57	82	
+15 mins.	10	16	26	25	10	35	49	66	115	
+30 mins.	9	10	19	11	10	21	43	71	114	
+45 mins.	6	23	29	14	7	21	30	102	132	
Total Volume	39	65	104	68	33	101	147	296	443	
% App. Total	37.5	62.5		67.3	32.7		33.2	66.8		
PHF	.696	.707	.867	.680	.825	.721	.750	.725	.839	



**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

File Name : 547J0005  
 Site Code : 547J0005  
 Start Date : 9/25/2018  
 Page No : 7

**Groups Printed- Trucks**

	Grove St From North		Hampden St From East		Grove St From South		Int. Total	
	Start Time	Left	Thru	Left	Right	Thru	Right	
07:00 AM		0	1	0	0	2	1	4
07:15 AM		0	0	0	0	1	0	1
07:30 AM		0	0	0	0	1	0	1
07:45 AM		0	2	0	0	1	1	4
Total		0	3	0	0	5	2	10
08:00 AM		2	1	0	0	1	2	6
08:15 AM		0	1	0	0	0	0	1
08:30 AM		1	1	0	0	1	0	3
08:45 AM		0	0	0	1	1	0	2
Total		3	3	0	1	3	2	12
Grand Total		3	6	0	1	8	4	22
Apprch %		33.3	66.7	0	100	66.7	33.3	
Total %		13.6	27.3	0	4.5	36.4	18.2	

**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

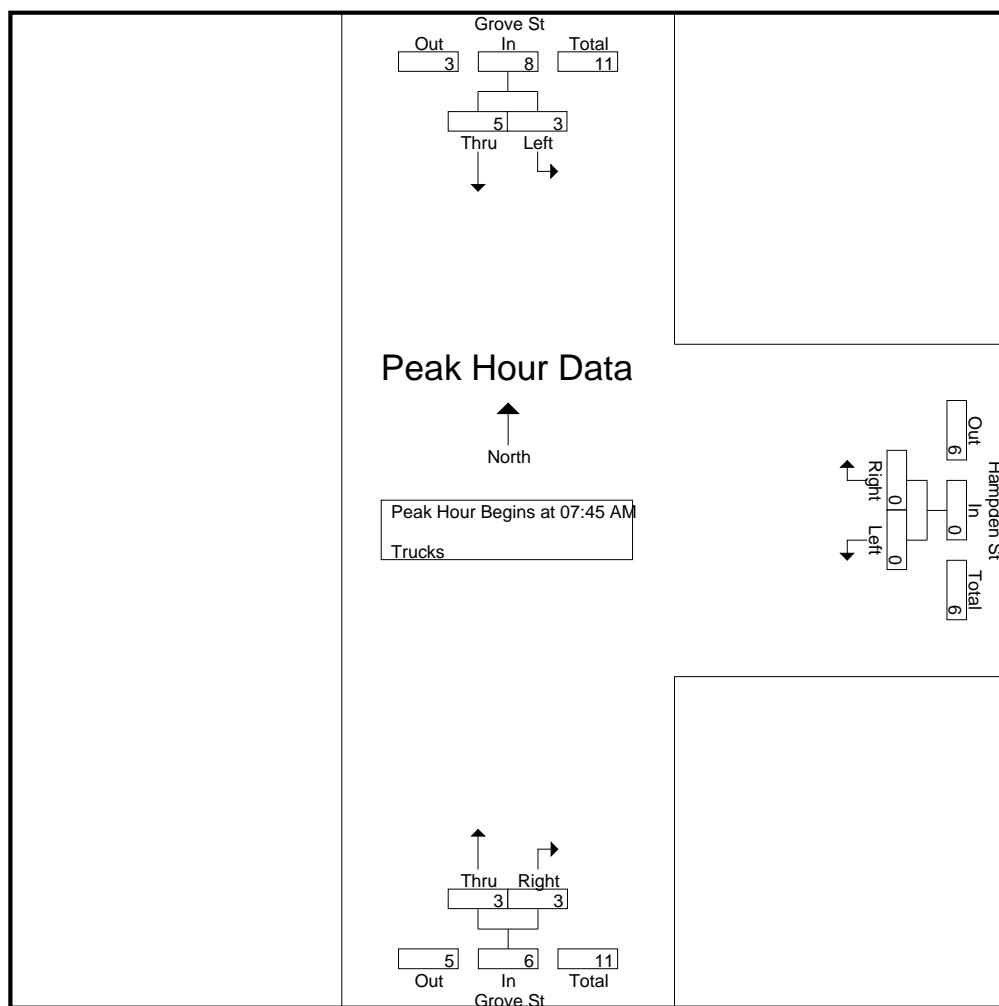
File Name : 547J0005  
 Site Code : 547J0005  
 Start Date : 9/25/2018  
 Page No : 8

	Grove St			Hampden St			Grove St			
	From North			From East			From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:45 AM

07:45 AM	0	<b>2</b>	2	0	0	0	<b>1</b>	1	2	4
08:00 AM	<b>2</b>	1	<b>3</b>	0	0	0	1	<b>2</b>	<b>3</b>	<b>6</b>
08:15 AM	0	1	1	0	0	0	0	0	0	1
08:30 AM	1	1	2	0	0	0	1	0	1	3
Total Volume	3	5	8	0	0	0	3	3	6	14
% App. Total	37.5	62.5		0	0		50	50		
PHF	.375	.625	.667	.000	.000	.000	.750	.375	.500	.583



**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

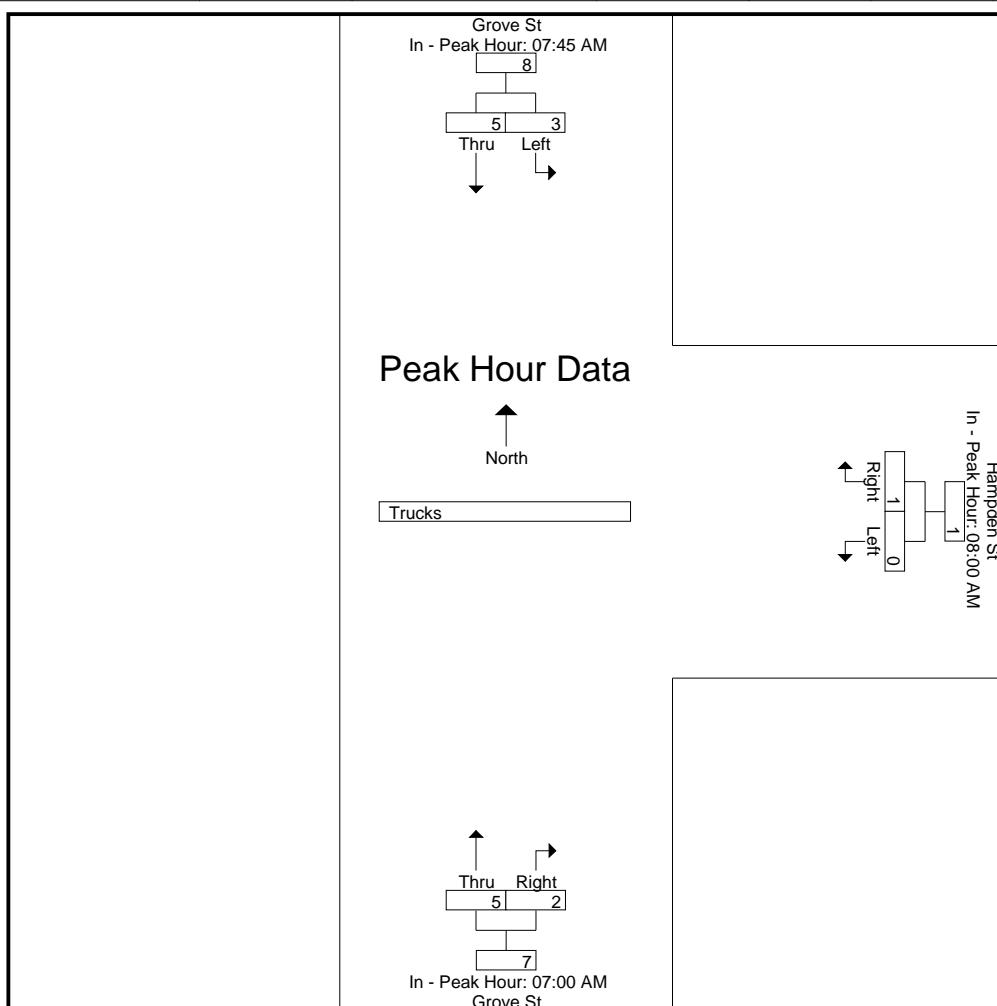
File Name : 547J0005  
 Site Code : 547J0005  
 Start Date : 9/25/2018  
 Page No : 9

	Grove St			Hampden St			Grove St			
	From North			From East			From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:45 AM	08:00 AM			07:00 AM		
+0 mins.	0	<b>2</b>	2	0	0	0	<b>2</b>
+15 mins.	<b>2</b>	1	<b>3</b>	0	0	0	1
+30 mins.	0	1	1	0	0	0	1
+45 mins.	1	1	2	0	<b>1</b>	<b>1</b>	1
Total Volume	3	5	8	0	1	1	5
% App. Total	37.5	62.5		0	100		71.4
PHF	.375	.625	.667	.000	.250	.250	.625
							.500
							.583



**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

File Name : 547J0005  
 Site Code : 547J0005  
 Start Date : 9/25/2018  
 Page No : 10

**Groups Printed- Bikes Peds**

	Grove St From North			Hampden St From East			Grove St From South						
	Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Excl. Total	Incl. Total	Int. Total
07:00 AM		0	0	4	0	0	0	1	0	0	4	1	5
07:15 AM		0	0	0	0	0	2	0	0	0	2	0	2
07:30 AM		0	0	1	0	0	1	0	0	0	2	0	2
07:45 AM		0	0	2	0	0	0	0	0	0	2	0	2
Total		0	0	7	0	0	3	1	0	0	10	1	11
08:00 AM		0	0	3	0	0	5	0	0	0	8	0	8
08:15 AM		0	0	6	0	0	1	1	0	0	7	1	8
08:30 AM		0	0	2	0	0	0	0	0	1	3	0	3
08:45 AM		0	0	2	0	0	1	0	0	0	3	0	3
Total		0	0	13	0	0	7	1	0	1	21	1	22
Grand Total		0	0	20	0	0	10	2	0	1	31	2	33
Apprch %		0	0		0	0		100	0				
Total %		0	0		0	0		100	0		93.9	6.1	

**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

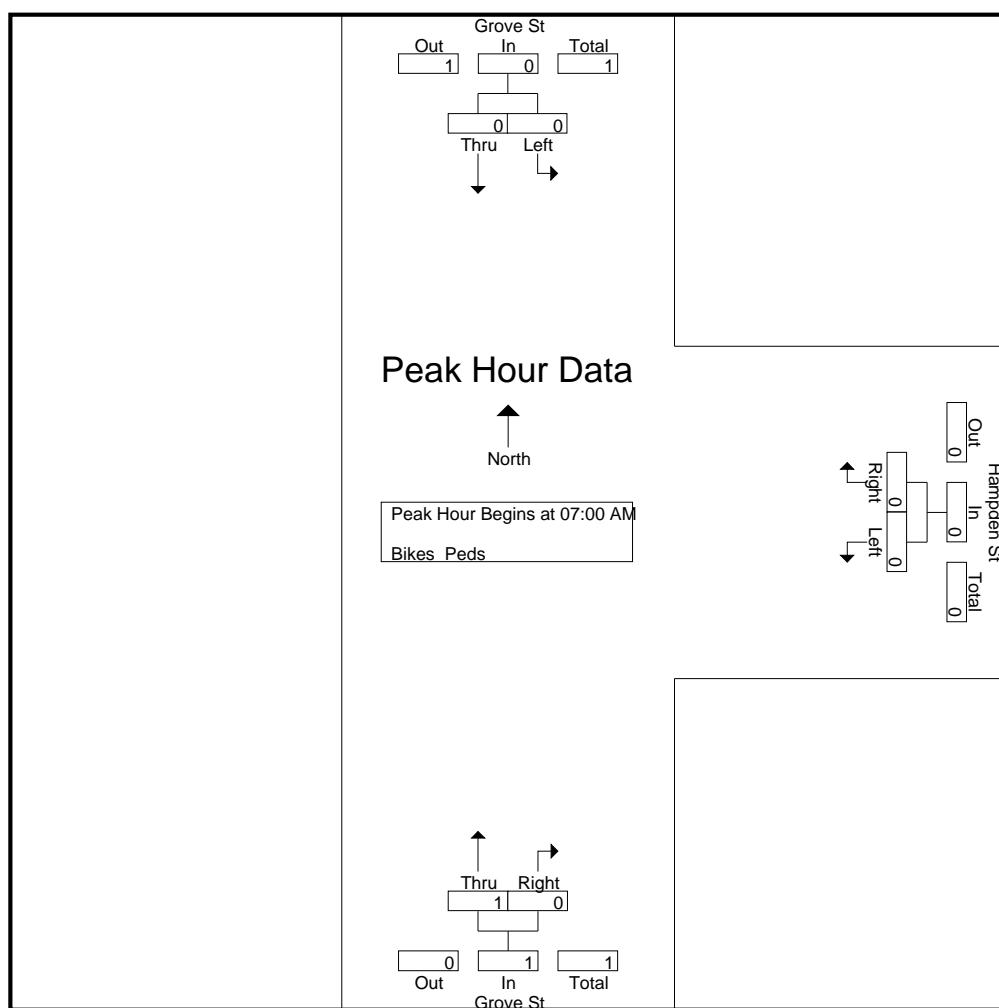
File Name : 547J0005  
 Site Code : 547J0005  
 Start Date : 9/25/2018  
 Page No : 11

	Grove St			Hampden St			Grove St			
	From North			From East			From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:00 AM

07:00 AM	0	0	0	0	0	0	1	0	1	1
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	1	0	1	1
% App. Total	0	0		0	0		100	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.250	.250



**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

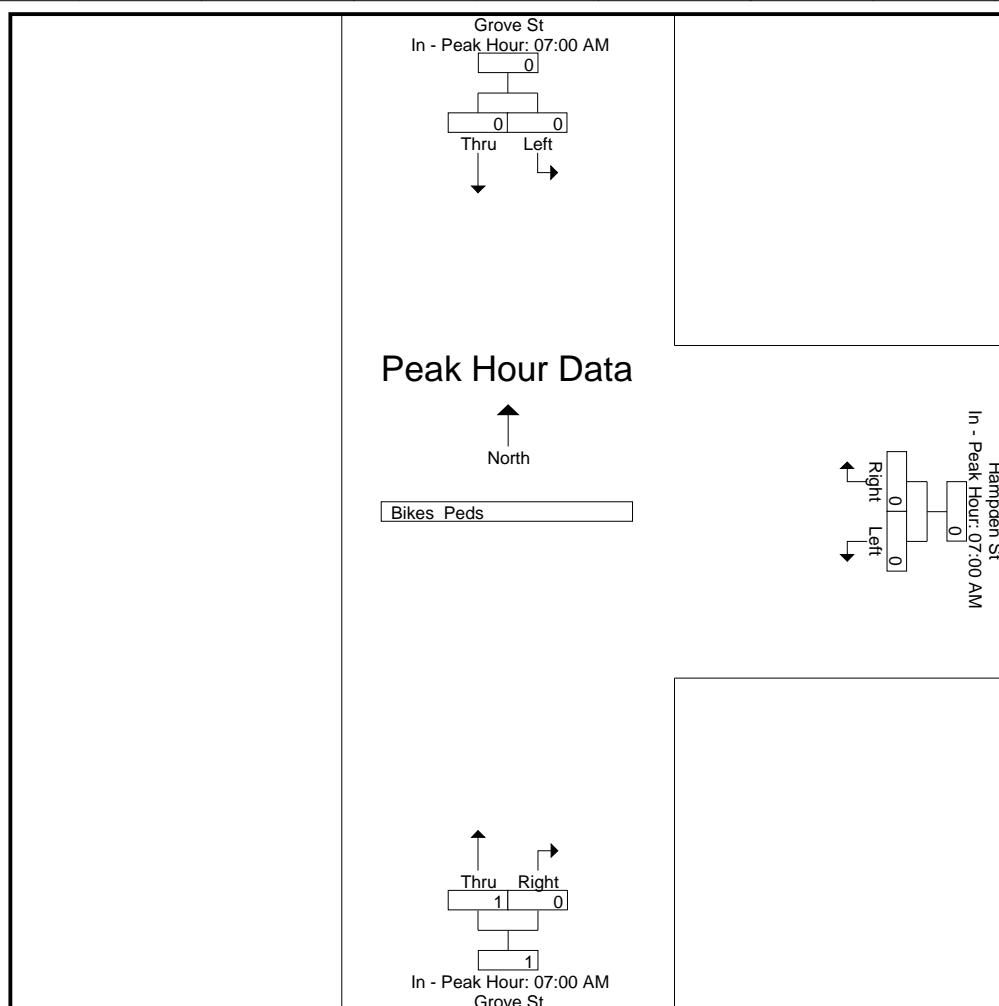
File Name : 547J0005  
 Site Code : 547J0005  
 Start Date : 9/25/2018  
 Page No : 12

	Grove St			Hampden St			Grove St			
	From North			From East			From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM	07:00 AM	07:00 AM
+0 mins.	0	0	0
+15 mins.	0	0	0
+30 mins.	0	0	0
+45 mins.	0	0	0
Total Volume	0	0	0
% App. Total	0	0	0
PHF	.000	.000	.000
	.000	.000	.000
	.250	.000	.250



**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0005  
 Site Code : 547J0005  
 Start Date : 9/25/2018  
 Page No : 1

**Groups Printed- Cars - Trucks**

	Grove St From North		Hampden St From East		Grove St From South		Int. Total	
	Start Time	Left	Thru	Left	Right	Thru	Right	
02:00 PM		7	28	19	5	22	8	89
02:15 PM		7	8	14	2	15	12	58
02:30 PM		11	17	23	9	19	17	96
02:45 PM		4	25	22	9	12	30	102
Total		29	78	78	25	68	67	345
03:00 PM		4	48	27	9	20	16	124
03:15 PM		5	54	24	11	28	19	141
03:30 PM		7	30	43	8	34	13	135
03:45 PM		4	28	26	8	16	12	94
Total		20	160	120	36	98	60	494
Grand Total		49	238	198	61	166	127	839
Apprch %		17.1	82.9	76.4	23.6	56.7	43.3	
Total %		5.8	28.4	23.6	7.3	19.8	15.1	
Cars		49	236	198	60	165	126	834
% Cars		100	99.2	100	98.4	99.4	99.2	99.4
Trucks		0	2	0	1	1	1	5
% Trucks		0	0.8	0	1.6	0.6	0.8	0.6

**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Rain

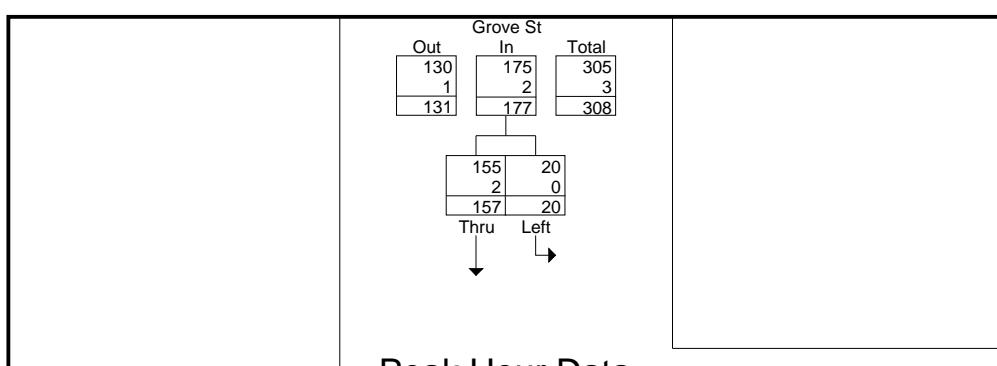
File Name : 547J0005  
 Site Code : 547J0005  
 Start Date : 9/25/2018  
 Page No : 2

	Grove St From North			Hampden St From East			Grove St From South			Int. Total
	Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total

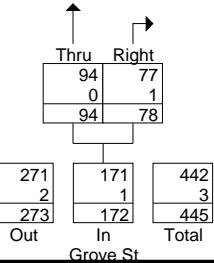
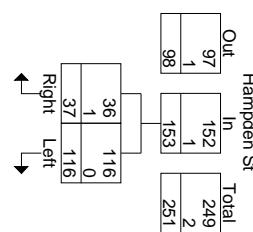
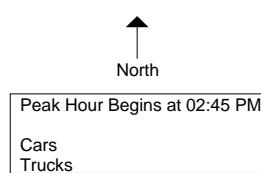
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 02:45 PM

02:45 PM	4	25	29	22	9	31	12	<b>30</b>	42	102
03:00 PM	4	48	52	27	9	36	20	16	36	124
03:15 PM	5	<b>54</b>	<b>59</b>	24	<b>11</b>	35	28	19	<b>47</b>	<b>141</b>
03:30 PM	<b>7</b>	30	37	<b>43</b>	8	<b>51</b>	<b>34</b>	13	<b>47</b>	135
Total Volume	20	157	177	116	37	153	94	78	172	502
% App. Total	11.3	88.7		75.8	24.2		54.7	45.3		
PHF	.714	.727	.750	.674	.841	.750	.691	.650	.915	.890
Cars	20	155	175	116	36	152	94	77	171	498
% Cars	100	98.7	98.9	100	97.3	99.3	100	98.7	99.4	99.2
Trucks	0	2	2	0	1	1	0	1	1	4
% Trucks	0	1.3	1.1	0	2.7	0.7	0	1.3	0.6	0.8



### Peak Hour Data



**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
E/W Street: Hamden Street  
City/State : Wellesley, MA  
Weather : Rain

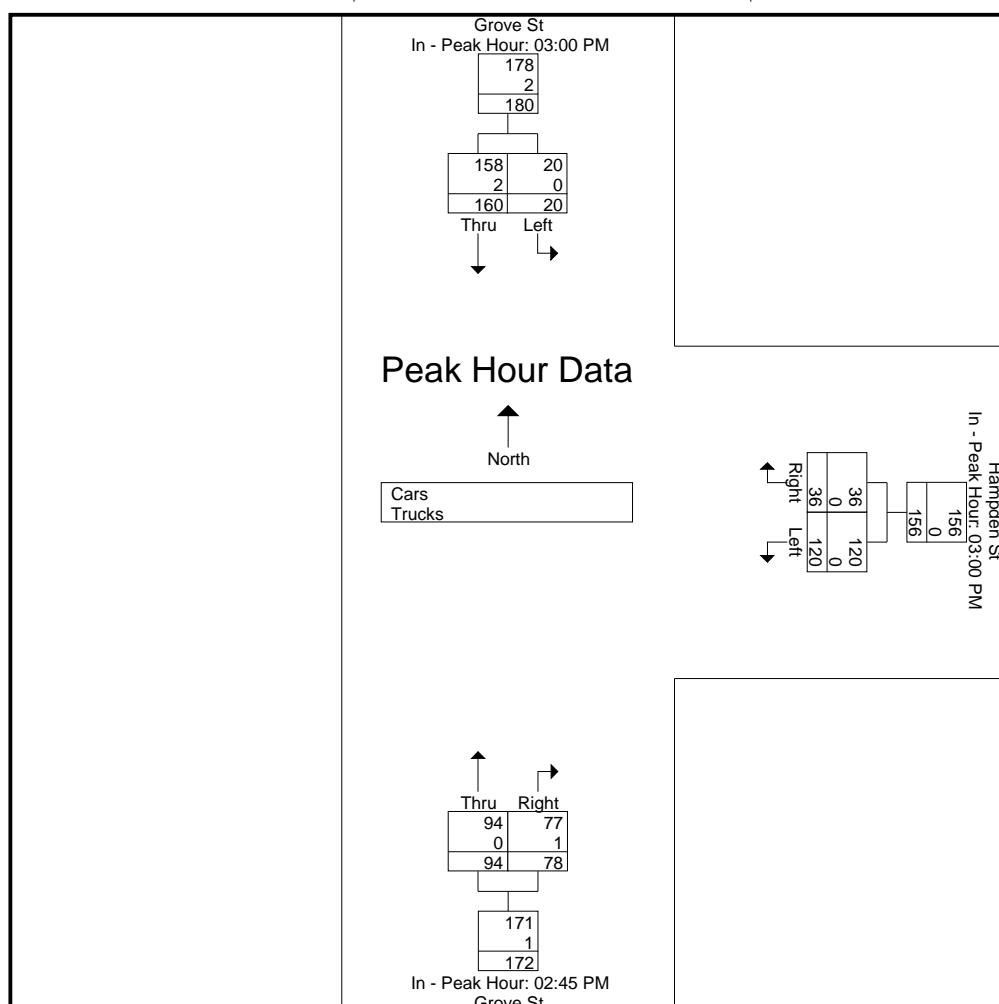
File Name : 547J0005  
Site Code : 547J0005  
Start Date : 9/25/2018  
Page No : 3

	Grove St From North			Hampden St From East			Grove St From South			Int. Total
	Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	03:00 PM			03:00 PM			02:45 PM			
+0 mins.	4	48	52	27	9	36	12	30	42	
+15 mins.	5	54	59	24	11	35	20	16	36	
+30 mins.	7	30	37	43	8	51	28	19	47	
+45 mins.	4	28	32	26	8	34	34	13	47	
Total Volume	20	160	180	120	36	156	94	78	172	
% App. Total	11.1	88.9		76.9	23.1		54.7	45.3		
PHF	.714	.741	.763	.698	.818	.765	.691	.650	.915	
Cars	20	158	178	120	36	156	94	77	171	
% Cars	100	98.8	98.9	100	100	100	100	98.7	99.4	
Trucks	0	2	2	0	0	0	0	1	1	
% Trucks	0	1.2	1.1	0	0	0	0	1.3	0.6	



**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0005  
 Site Code : 547J0005  
 Start Date : 9/25/2018  
 Page No : 4

**Groups Printed- Cars**

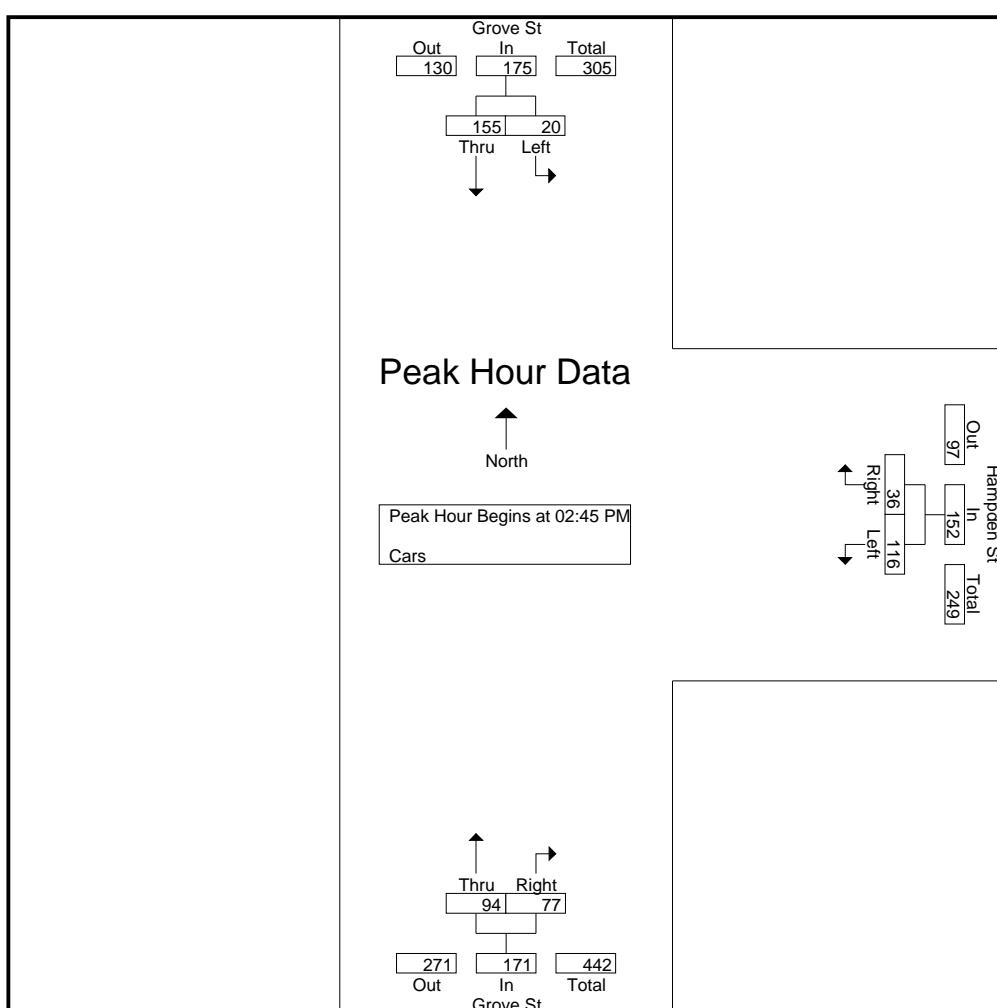
	Grove St From North		Hampden St From East		Grove St From South		Int. Total	
	Start Time	Left	Thru	Left	Right	Thru	Right	
02:00 PM		7	28	19	5	21	8	88
02:15 PM		7	8	14	2	15	12	58
02:30 PM		11	17	23	9	19	17	96
02:45 PM		4	25	22	8	12	30	101
Total		29	78	78	24	67	67	343
03:00 PM		4	47	27	9	20	15	122
03:15 PM		5	53	24	11	28	19	140
03:30 PM		7	30	43	8	34	13	135
03:45 PM		4	28	26	8	16	12	94
Total		20	158	120	36	98	59	491
Grand Total		49	236	198	60	165	126	834
Apprch %		17.2	82.8	76.7	23.3	56.7	43.3	
Total %		5.9	28.3	23.7	7.2	19.8	15.1	

**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0005  
 Site Code : 547J0005  
 Start Date : 9/25/2018  
 Page No : 5

	Grove St From North			Hampden St From East			Grove St From South			Int. Total	
	Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1											
Peak Hour for Entire Intersection Begins at 02:45 PM											
02:45 PM	4	25	29		22	8	30	12	<b>30</b>	42	101
03:00 PM	4	47	51		27	9	36	20	15	35	122
03:15 PM	5	<b>53</b>	<b>58</b>		24	<b>11</b>	35	28	19	<b>47</b>	<b>140</b>
03:30 PM	<b>7</b>	30	37		<b>43</b>	8	<b>51</b>	<b>34</b>	13	47	135
Total Volume	20	155	175		116	36	152	94	77	171	498
% App. Total	11.4	88.6			76.3	23.7		55	45		
PHF	.714	.731	.754		.674	.818	.745	.691	.642	.910	.889



**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Rain

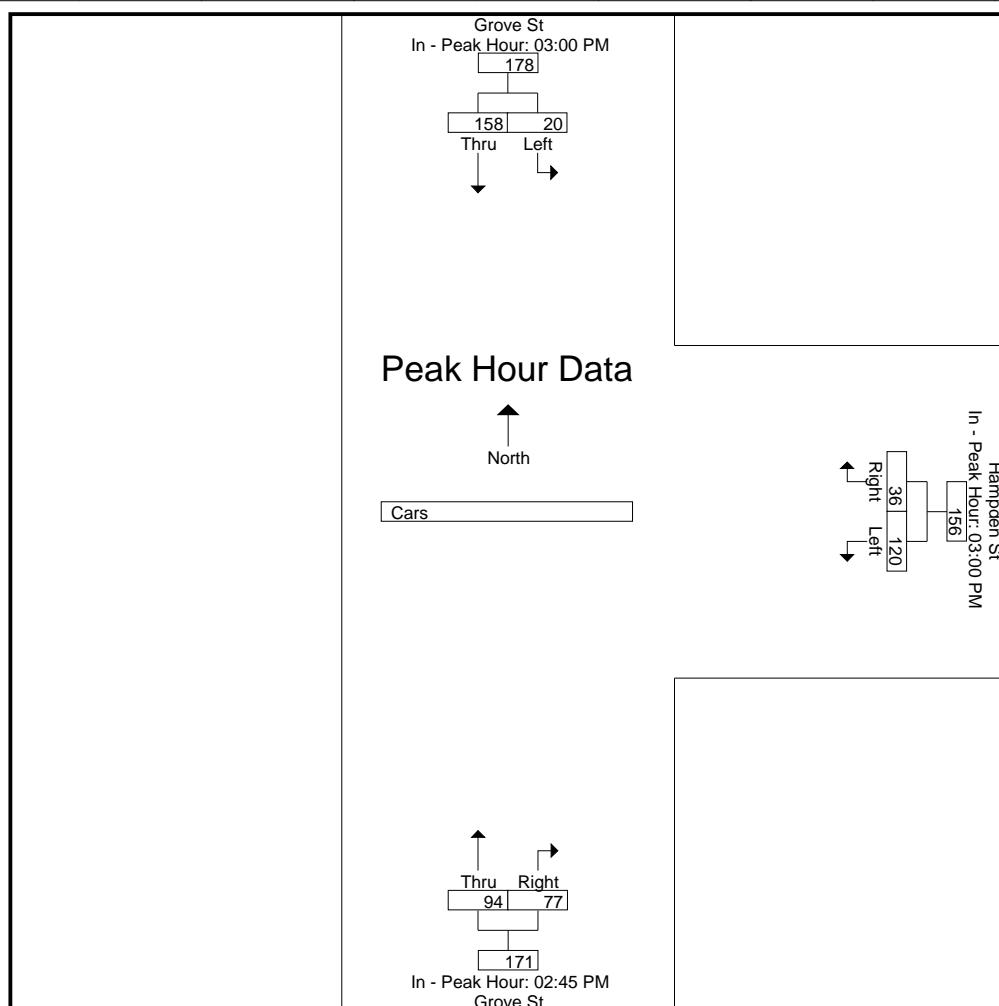
File Name : 547J0005  
 Site Code : 547J0005  
 Start Date : 9/25/2018  
 Page No : 6

	Grove St			Hampden St			Grove St			
	From North			From East			From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	03:00 PM			03:00 PM			02:45 PM		
+0 mins.	4	47	51	27	9	36	12	30	42
+15 mins.	5	53	58	24	11	35	20	15	35
+30 mins.	7	30	37	43	8	51	28	19	47
+45 mins.	4	28	32	26	8	34	34	13	47
Total Volume	20	158	178	120	36	156	94	77	171
% App. Total	11.2	88.8		76.9	23.1		55	45	
PHF	.714	.745	.767	.698	.818	.765	.691	.642	.910



**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0005  
 Site Code : 547J0005  
 Start Date : 9/25/2018  
 Page No : 7

**Groups Printed- Trucks**

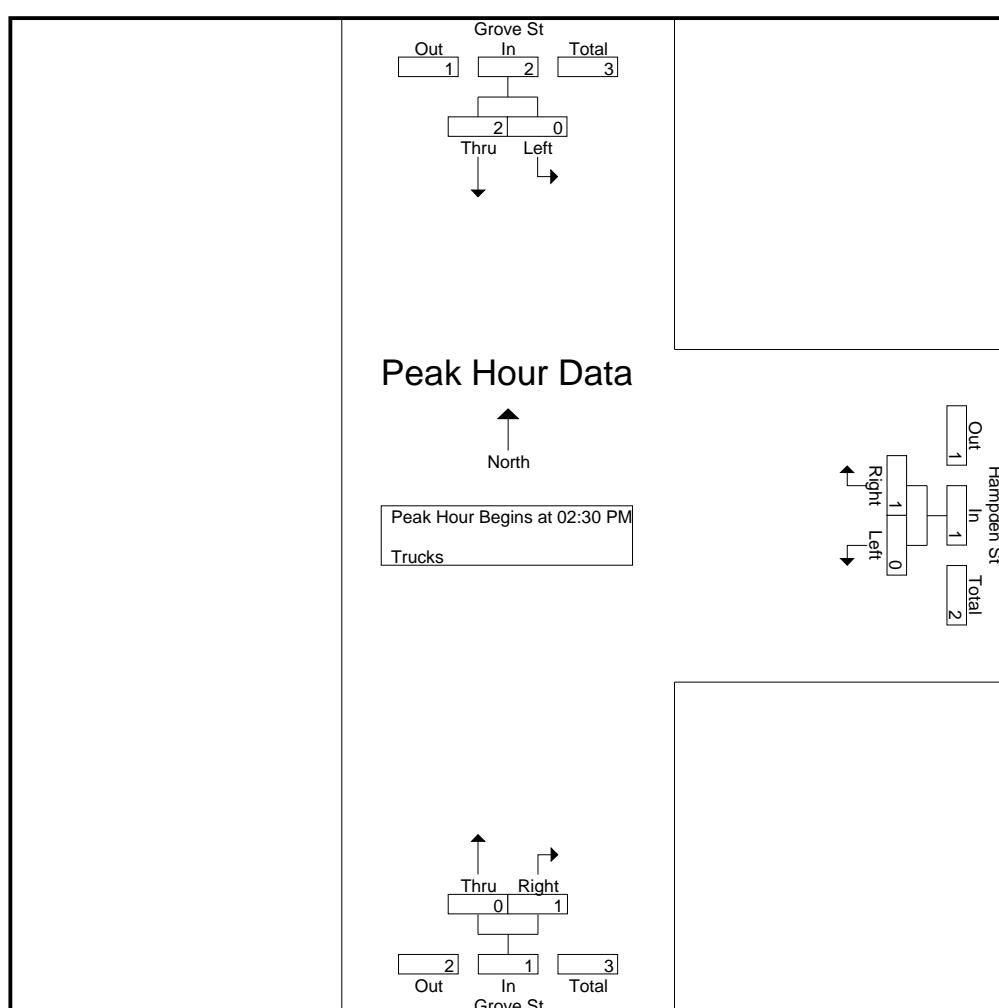
	Grove St From North		Hampden St From East		Grove St From South		Int. Total	
	Start Time	Left	Thru	Left	Right	Thru	Right	
02:00 PM		0	0	0	0	1	0	1
02:15 PM		0	0	0	0	0	0	0
02:30 PM		0	0	0	0	0	0	0
02:45 PM		0	0	0	1	0	0	1
Total		0	0	0	1	1	0	2
03:00 PM		0	1	0	0	0	1	2
03:15 PM		0	1	0	0	0	0	1
03:30 PM		0	0	0	0	0	0	0
03:45 PM		0	0	0	0	0	0	0
Total		0	2	0	0	0	1	3
Grand Total		0	2	0	1	1	1	5
Apprch %		0	100	0	100	50	50	
Total %		0	40	0	20	20	20	

**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0005  
 Site Code : 547J0005  
 Start Date : 9/25/2018  
 Page No : 8

	Grove St From North			Hampden St From East			Grove St From South			Int. Total
	Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:30 PM										
02:30 PM	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	1	1	0	0	0	1
03:00 PM	0	1	1	0	0	0	0	1	1	2
03:15 PM	0	1	1	0	0	0	0	0	0	1
Total Volume	0	2	2	0	1	1	0	1	1	4
% App. Total	0	100		0	100		0	100		
PHF	.000	.500	.500	.000	.250	.250	.000	.250	.250	.500



**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Rain

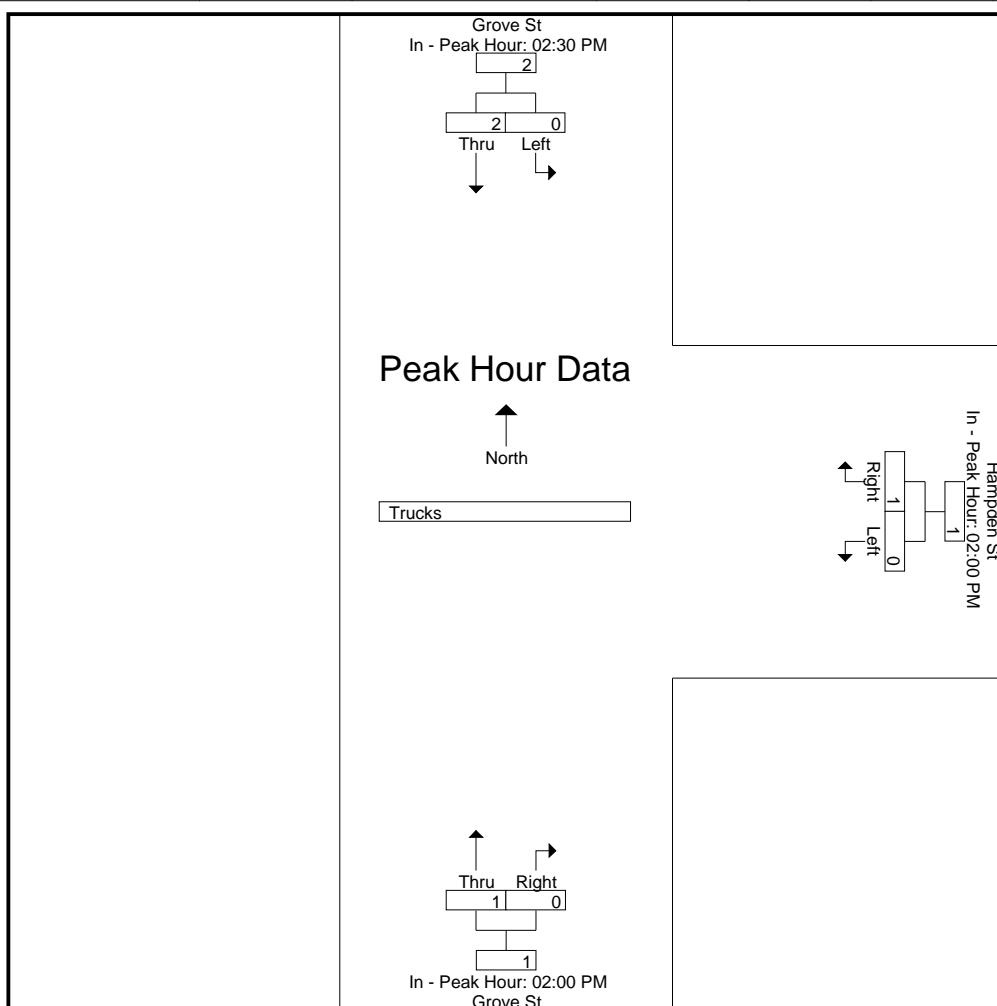
File Name : 547J0005  
 Site Code : 547J0005  
 Start Date : 9/25/2018  
 Page No : 9

	Grove St			Hampden St			Grove St			
	From North			From East			From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	02:30 PM	02:00 PM	02:00 PM
+0 mins.	0 0 0	0 0 0	1 0 1
+15 mins.	0 0 0	0 0 0	0 0 0
+30 mins.	0 1 1	0 0 0	0 0 0
+45 mins.	0 1 1	0 1 1	0 0 0
Total Volume	0 2 2	0 1 1	1 0 1
% App. Total	0 100	0 100	100 0
PHF	.000 .500 .500	.000 .250 .250	.250 .000 .250



**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0005  
 Site Code : 547J0005  
 Start Date : 9/25/2018  
 Page No : 10

**Groups Printed- Bikes Peds**

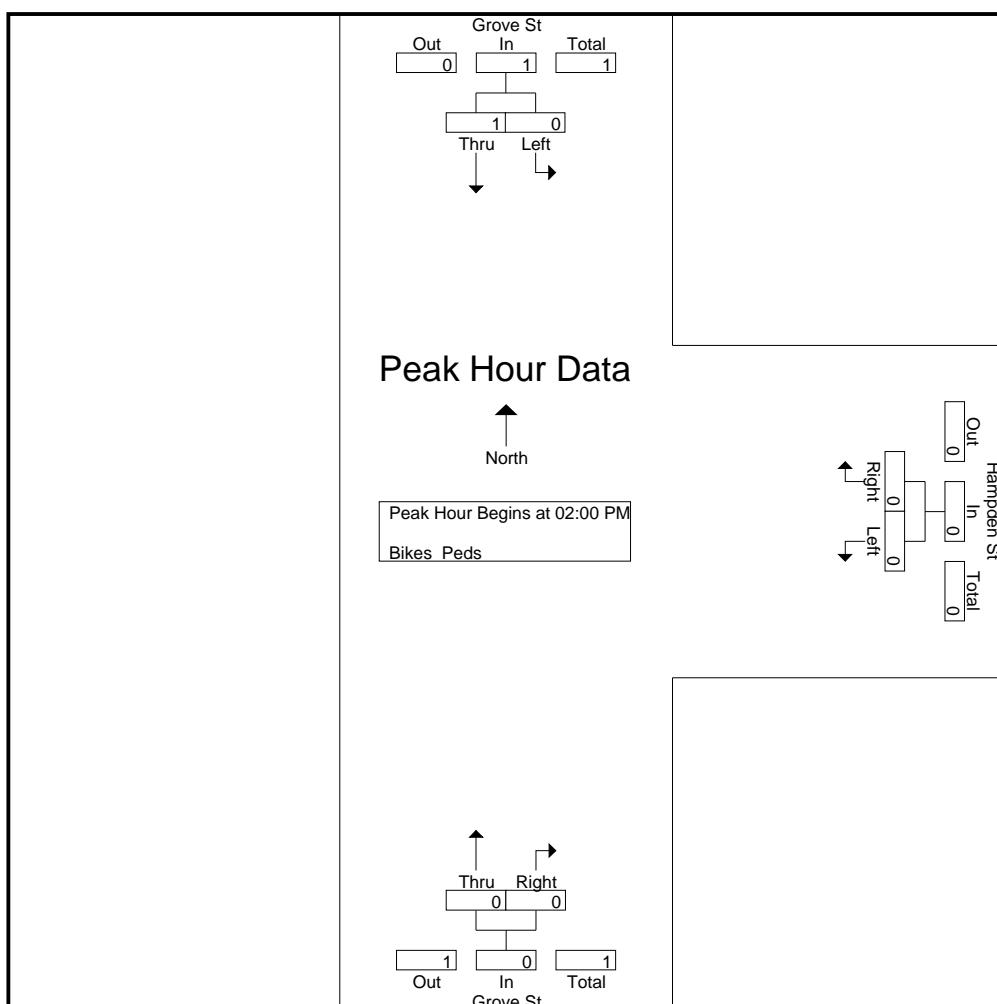
	Grove St From North			Hampden St From East			Grove St From South						
	Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Excl. Total	Incl. Total	Int. Total
02:00 PM		0	0	1	0	0	0	0	0	0	1	0	1
02:15 PM		0	0	0	0	0	1	0	0	0	1	0	1
02:30 PM		0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM		0	1	1	0	0	1	0	0	0	2	1	3
Total		0	1	2	0	0	2	0	0	0	4	1	5
03:00 PM		0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM		0	0	6	0	0	0	0	0	0	6	0	6
03:30 PM		0	0	6	0	0	1	0	0	0	7	0	7
03:45 PM		0	0	16	0	0	3	0	0	0	19	0	19
Total		0	0	28	0	0	4	0	0	0	32	0	32
Grand Total		0	1	30	0	0	6	0	0	0	36	1	37
Apprch %		0	100		0	0		0	0				
Total %		0	100		0	0		0	0		97.3	2.7	

**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0005  
 Site Code : 547J0005  
 Start Date : 9/25/2018  
 Page No : 11

	Grove St From North			Hampden St From East			Grove St From South			Int. Total
	Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:00 PM										
02:00 PM	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	1	1	0	0	0	0	0	0	1
Total Volume	0	1	1	0	0	0	0	0	0	1
% App. Total	0	100		0	0		0	0		
PHF	.000	.250	.250	.000	.000	.000	.000	.000	.000	.250



**Accurate Counts**  
978-664-2565

N/S Street : Grove Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Rain

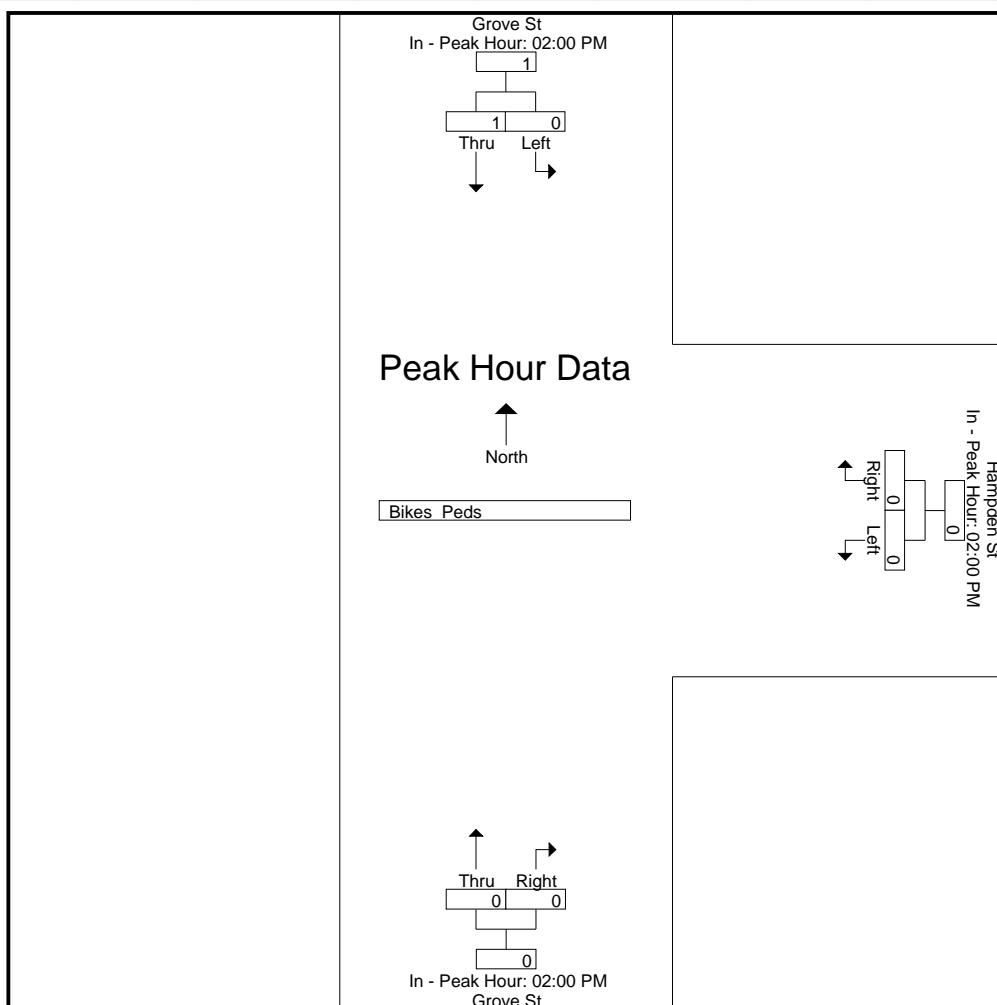
File Name : 547J0005  
 Site Code : 547J0005  
 Start Date : 9/25/2018  
 Page No : 12

	Grove St			Hampden St			Grove St			
	From North			From East			From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	02:00 PM	02:00 PM	02:00 PM
+0 mins.	0 0 0	0 0 0	0 0 0
+15 mins.	0 0 0	0 0 0	0 0 0
+30 mins.	0 0 0	0 0 0	0 0 0
+45 mins.	0 1 1	0 0 0	0 0 0
Total Volume	0 1 1	0 0 0	0 0 0
% App. Total	0 100	0 0	0 0
PHF	.000 .250 .250	.000 .000 .000	.000 .000 .000



**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

File Name : 547J0006  
 Site Code : 547J0006  
 Start Date : 9/25/2018  
 Page No : 1

**Groups Printed- Cars - Trucks**

Start Time	Cameron St From North		Hampden St From East		Hampden St From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
07:00 AM	0	2	10	3	1	27	43
07:15 AM	0	0	21	2	4	56	83
07:30 AM	1	4	46	5	9	34	99
07:45 AM	2	8	75	13	13	36	147
Total	3	14	152	23	27	153	372
08:00 AM	1	0	22	15	21	58	117
08:15 AM	0	0	18	45	57	60	180
08:30 AM	2	3	9	7	12	35	68
08:45 AM	2	0	17	9	8	28	64
Total	5	3	66	76	98	181	429
Grand Total	8	17	218	99	125	334	801
Apprch %	32	68	68.8	31.2	27.2	72.8	
Total %	1	2.1	27.2	12.4	15.6	41.7	
Cars	8	17	217	98	122	332	794
% Cars	100	100	99.5	99	97.6	99.4	99.1
Trucks	0	0	1	1	3	2	7
% Trucks	0	0	0.5	1	2.4	0.6	0.9

**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

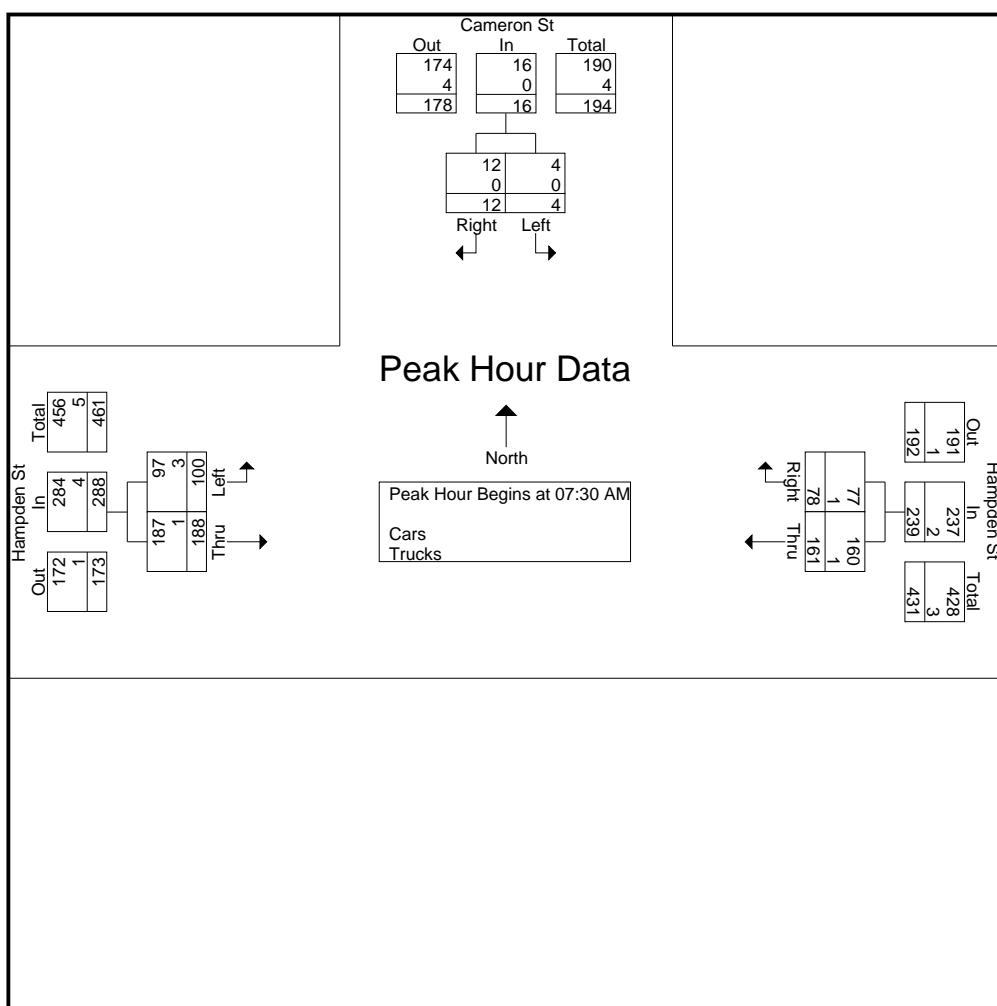
File Name : 547J0006  
 Site Code : 547J0006  
 Start Date : 9/25/2018  
 Page No : 2

	Cameron St			Hampden St			Hampden St			
	From North			From East			From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:30 AM

07:30 AM	1	4	5	46	5	51	9	34	43	99
07:45 AM	2	8	10	75	13	88	13	36	49	147
08:00 AM	1	0	1	22	15	37	21	58	79	117
08:15 AM	0	0	0	18	45	63	57	60	117	180
Total Volume	4	12	16	161	78	239	100	188	288	543
% App. Total	25	75		67.4	32.6		34.7	65.3		
PHF	.500	.375	.400	.537	.433	.679	.439	.783	.615	.754
Cars	4	12	16	160	77	237	97	187	284	537
% Cars	100	100	100	99.4	98.7	99.2	97.0	99.5	98.6	98.9
Trucks	0	0	0	1	1	2	3	1	4	6
% Trucks	0	0	0	0.6	1.3	0.8	3.0	0.5	1.4	1.1



**Accurate Counts**  
978-664-2565

File Name : 547J0006  
Site Code : 547J0006  
Start Date : 9/25/2018  
Page No : 3

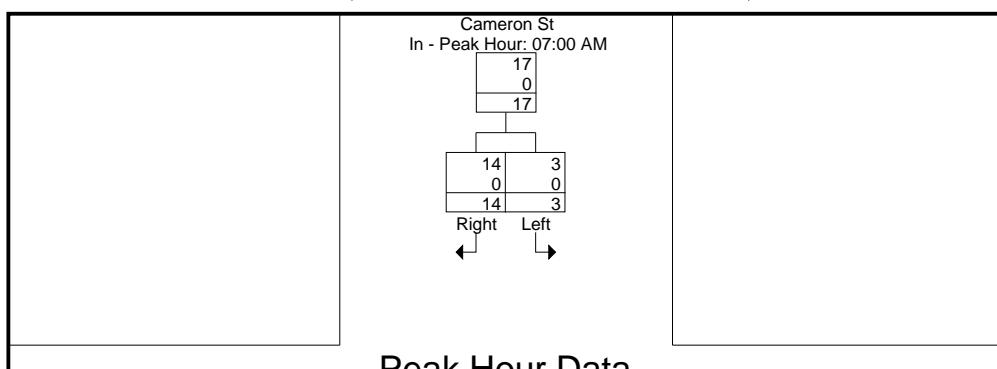
N/S Street : Cameron Street  
E/W Street: Hamden Street  
City/State : Wellesley, MA  
Weather : Cloudy

	Cameron St			Hampden St			Hampden St			
	From North			From East			From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total

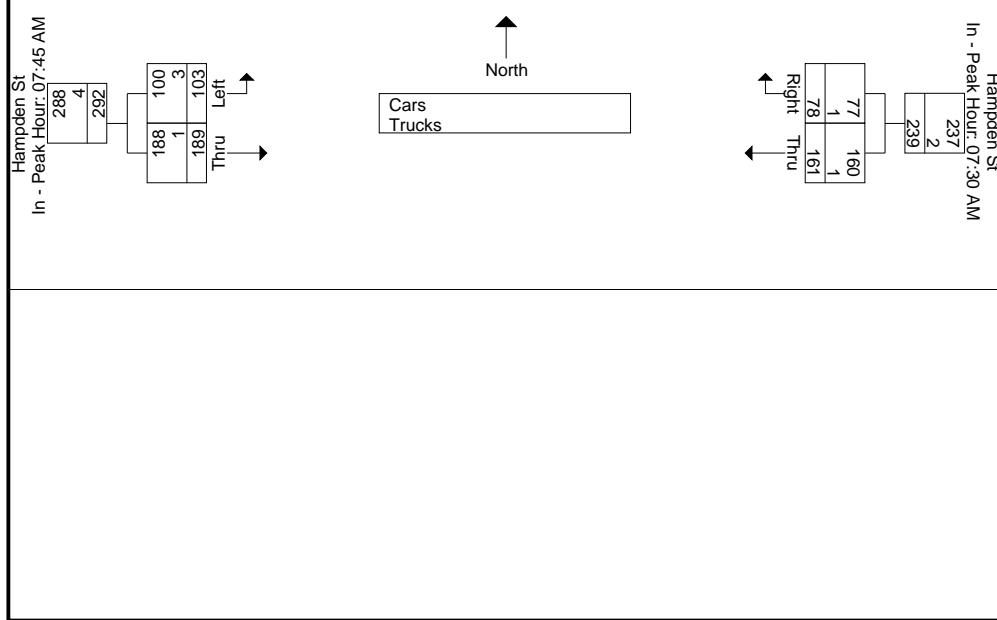
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM	07:30 AM			07:45 AM		
+0 mins.	0	2	2	46	5	51	13
+15 mins.	0	0	0	75	13	88	21
+30 mins.	1	4	5	22	15	37	57
+45 mins.	2	8	10	18	45	63	12
Total Volume	3	14	17	161	78	239	103
% App. Total	17.6	82.4		67.4	32.6		35.3
PHF	.375	.438	.425	.537	.433	.679	.452
Cars	3	14	17	160	77	237	100
% Cars	100	100	100	99.4	98.7	99.2	97.1
Trucks	0	0	0	1	1	2	3
% Trucks	0	0	0	0.6	1.3	0.8	2.9



### Peak Hour Data



**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

File Name : 547J0006  
 Site Code : 547J0006  
 Start Date : 9/25/2018  
 Page No : 4

**Groups Printed- Cars**

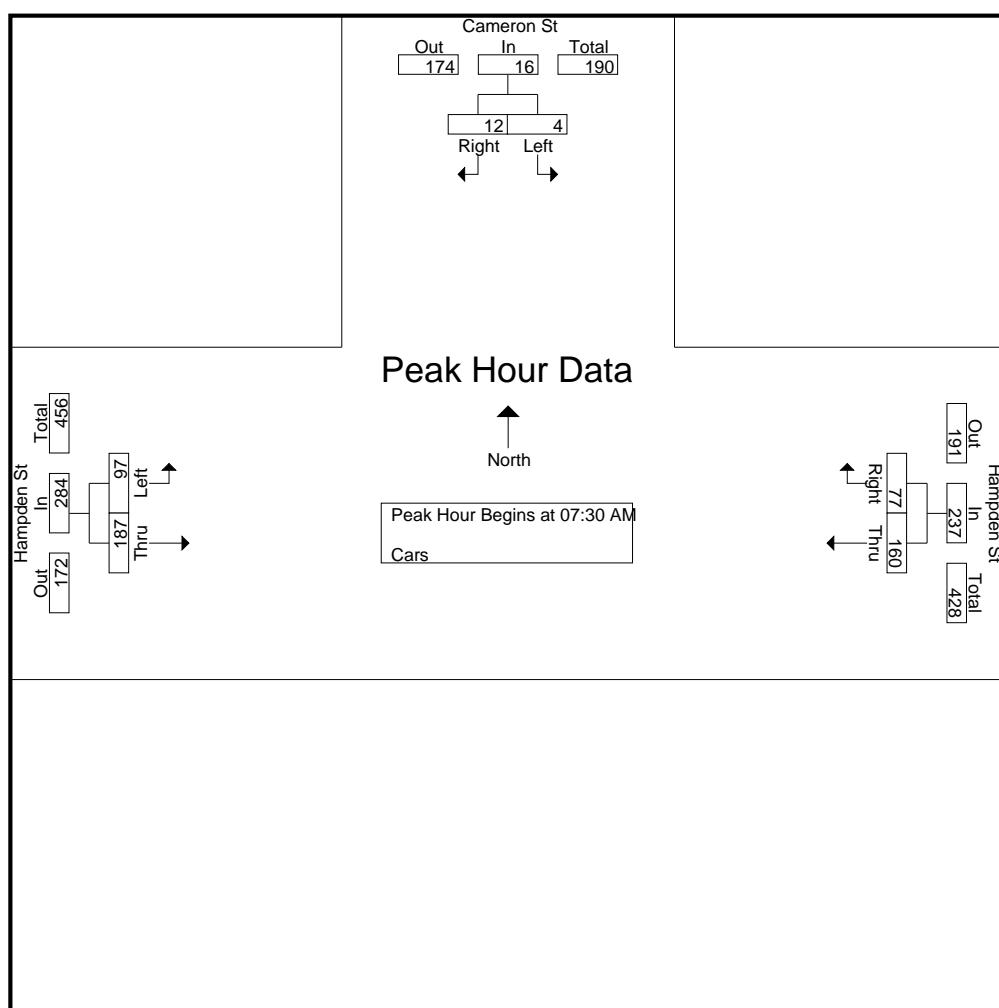
	Cameron St From North		Hampden St From East		Hampden St From West		Int. Total	
	Start Time	Left	Right	Thru	Right	Left	Thru	
07:00 AM		0	2	10	3	1	26	42
07:15 AM		0	0	21	2	4	56	83
07:30 AM		1	4	46	5	9	34	99
07:45 AM		2	8	74	13	13	36	146
Total		3	14	151	23	27	152	370
08:00 AM		1	0	22	14	19	58	114
08:15 AM		0	0	18	45	56	59	178
08:30 AM		2	3	9	7	12	35	68
08:45 AM		2	0	17	9	8	28	64
Total		5	3	66	75	95	180	424
Grand Total		8	17	217	98	122	332	794
Apprch %		32	68	68.9	31.1	26.9	73.1	
Total %		1	2.1	27.3	12.3	15.4	41.8	

**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

File Name : 547J0006  
 Site Code : 547J0006  
 Start Date : 9/25/2018  
 Page No : 5

	Cameron St			Hampden St			Hampden St			
	From North			From East			From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	1	4	5	46	5	51	9	34	43	99
07:45 AM	2	8	10	74	13	87	13	36	49	146
08:00 AM	1	0	1	22	14	36	19	58	77	114
08:15 AM	0	0	0	18	45	63	56	59	115	178
Total Volume	4	12	16	160	77	237	97	187	284	537
% App. Total	25	75		67.5	32.5		34.2	65.8		
PHF	.500	.375	.400	.541	.428	.681	.433	.792	.617	.754



**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

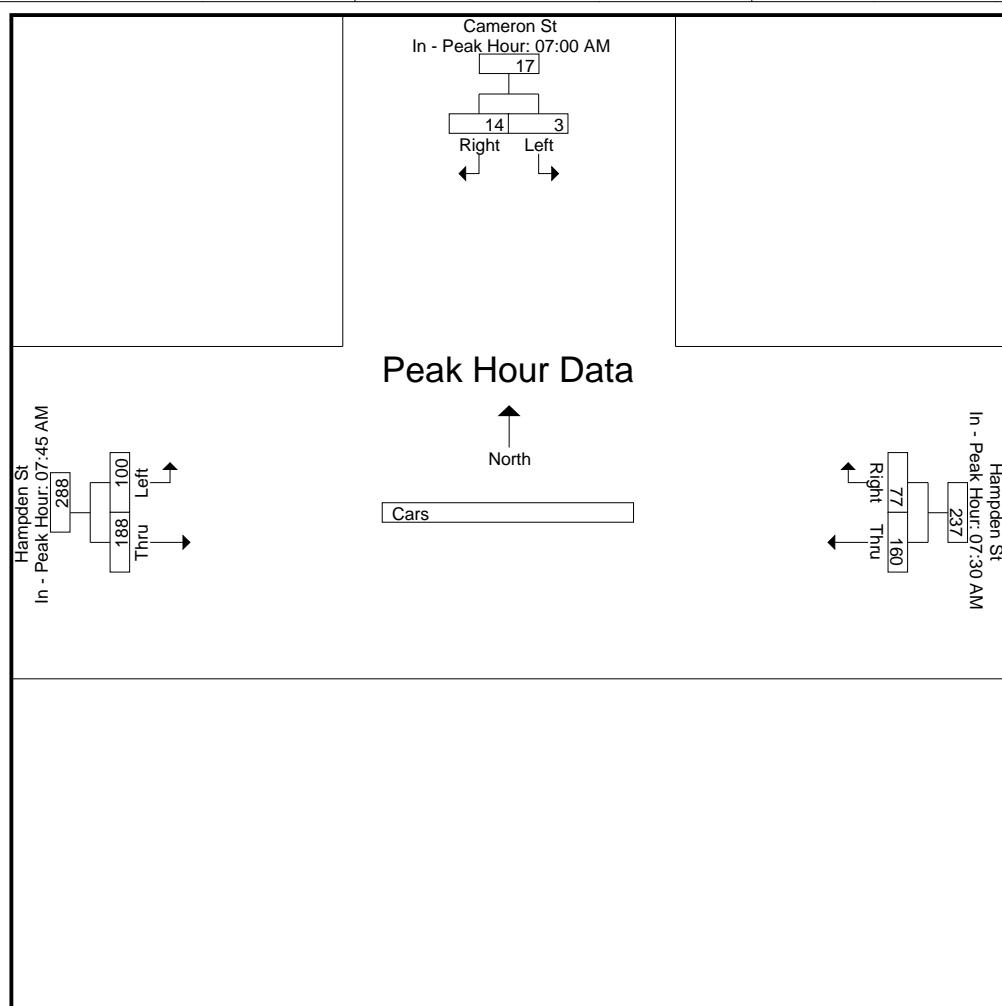
File Name : 547J0006  
 Site Code : 547J0006  
 Start Date : 9/25/2018  
 Page No : 6

	Cameron St From North			Hampden St From East			Hampden St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM		07:30 AM		07:45 AM	
+0 mins.	0	2	2	46	5	51
+15 mins.	0	0	0	74	13	87
+30 mins.	1	4	5	22	14	36
+45 mins.	2	8	10	18	45	63
Total Volume	3	14	17	160	77	237
% App. Total	17.6	82.4		67.5	32.5	
PHF	.375	.438	.425	.541	.428	.681



**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

File Name : 547J0006  
 Site Code : 547J0006  
 Start Date : 9/25/2018  
 Page No : 7

**Groups Printed- Trucks**

	Cameron St From North		Hampden St From East		Hampden St From West		Int. Total	
	Start Time	Left	Right	Thru	Right	Left	Thru	
07:00 AM		0	0	0	0	0	1	1
07:15 AM		0	0	0	0	0	0	0
07:30 AM		0	0	0	0	0	0	0
07:45 AM		0	0	1	0	0	0	1
Total		0	0	1	0	0	1	2
08:00 AM		0	0	0	1	2	0	3
08:15 AM		0	0	0	0	1	1	2
08:30 AM		0	0	0	0	0	0	0
08:45 AM		0	0	0	0	0	0	0
Total		0	0	0	1	3	1	5
Grand Total		0	0	1	1	3	2	7
Apprch %		0	0	50	50	60	40	
Total %		0	0	14.3	14.3	42.9	28.6	

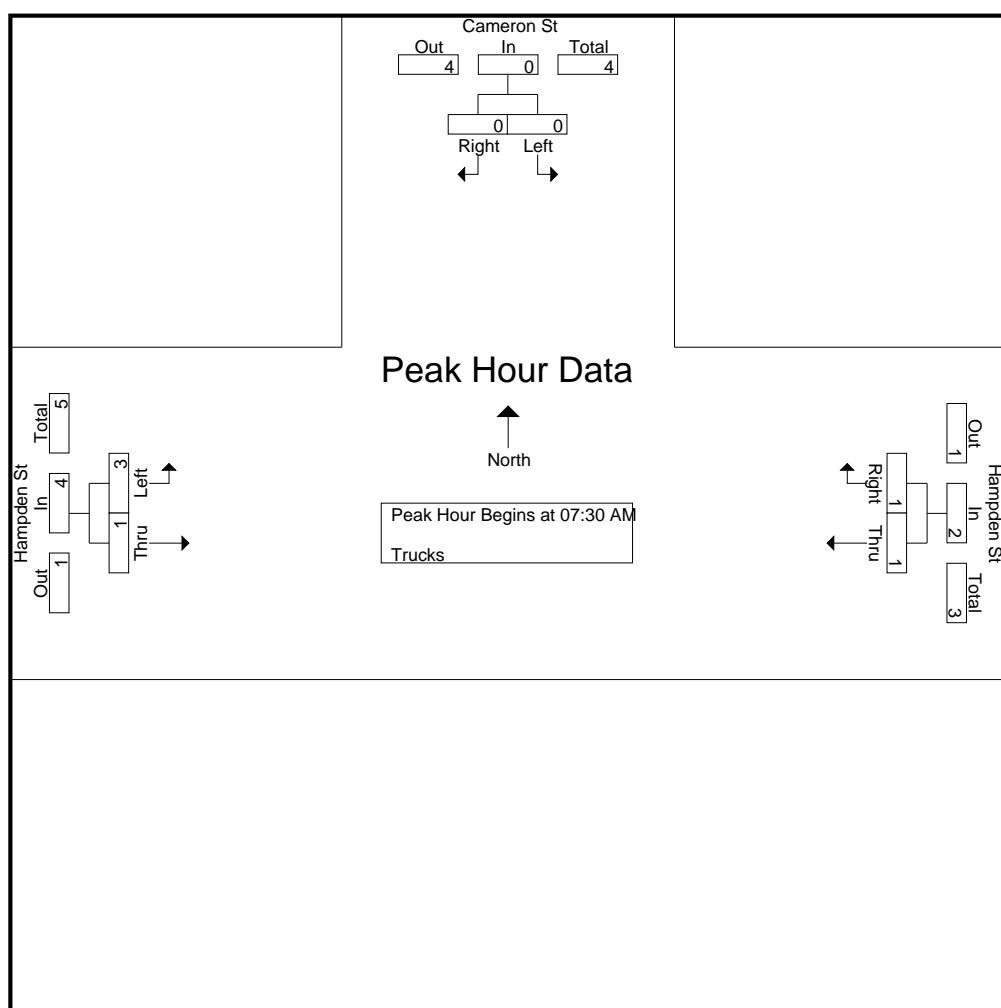
# **Accurate Counts**

978-664-2565

N/S Street : Cameron Street  
E/W Street: Hamden Street  
City/State : Wellesley, MA  
Weather : Cloudy

File Name : 547J0006  
Site Code : 547J0006  
Start Date : 9/25/2018  
Page No : 8

	Cameron St From North			Hampden St From East			Hampden St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	1	0	1	0	0	0	1
08:00 AM	0	0	0	0	1	1	2	0	2	3
08:15 AM	0	0	0	0	0	0	1	1	2	2
Total Volume	0	0	0	1	1	2	3	1	4	6
% App. Total	0	0		50	50		75	25		
PHF	.000	.000	.000	.250	.250	.500	.375	.250	.500	.500



**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

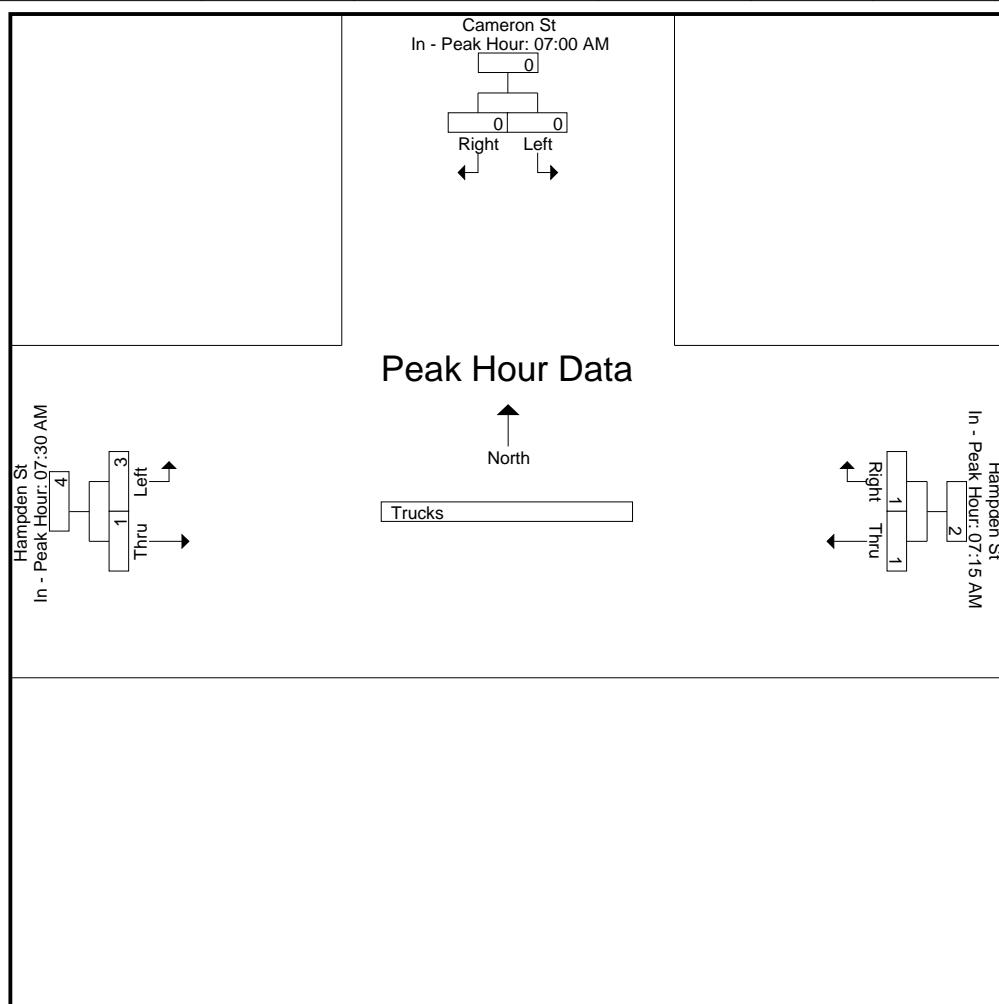
File Name : 547J0006  
 Site Code : 547J0006  
 Start Date : 9/25/2018  
 Page No : 9

	Cameron St			Hampden St			Hampden St			
	From North			From East			From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM	07:15 AM			07:30 AM		
+0 mins.	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0
+30 mins.	0	0	0	1	0	1	2
+45 mins.	0	0	0	0	1	1	1
Total Volume	0	0	0	1	1	2	3
% App. Total	0	0		50	50		75
PHF	.000	.000	.000	.250	.250	.500	.375
							.250
							.500



**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

File Name : 547J0006  
 Site Code : 547J0006  
 Start Date : 9/25/2018  
 Page No : 10

**Groups Printed- Bikes Peds**

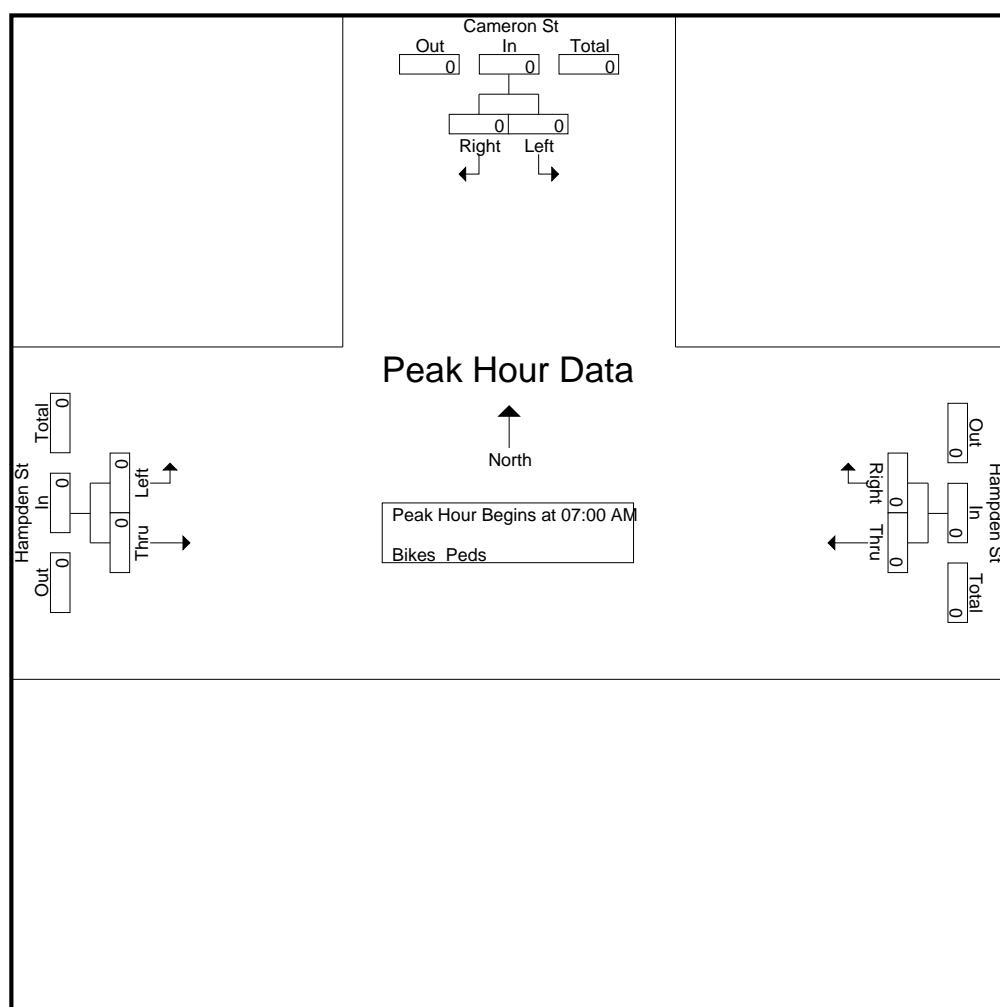
	Cameron St From North			Hampden St From East			Hampden St From West						
	Start Time	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds	Excl. Total	Incl. Total	Int. Total
07:00 AM		0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM		0	0	2	0	0	2	0	0	0	4	0	4
07:30 AM		0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM		0	0	0	0	0	1	0	0	0	1	0	1
Total		0	0	2	0	0	3	0	0	0	5	0	5
08:00 AM		0	0	1	0	0	3	0	0	0	4	0	4
08:15 AM		0	0	2	0	0	12	0	0	1	15	0	15
08:30 AM		0	0	0	0	0	2	0	0	1	3	0	3
08:45 AM		0	0	0	0	0	0	0	0	0	0	0	0
Total		0	0	3	0	0	17	0	0	2	22	0	22
Grand Total		0	0	5	0	0	20	0	0	2	27	0	27
Apprch %		0	0		0	0		0	0				
Total %											100	0	

**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

File Name : 547J0006  
 Site Code : 547J0006  
 Start Date : 9/25/2018  
 Page No : 11

	Cameron St			Hampden St			Hampden St			
	From North			From East			From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000



**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

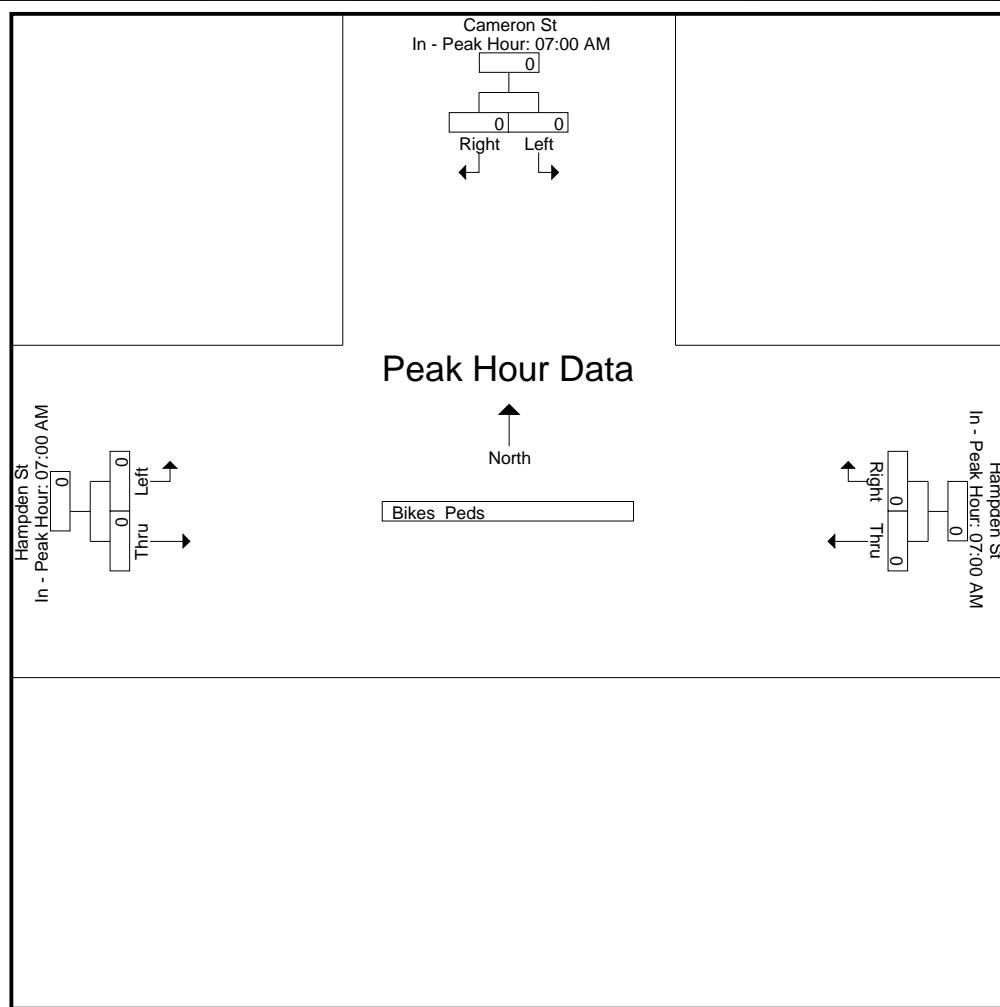
File Name : 547J0006  
 Site Code : 547J0006  
 Start Date : 9/25/2018  
 Page No : 12

	Cameron St From North			Hampden St From East			Hampden St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM	07:00 AM	07:00 AM
+0 mins.	0 0 0	0 0 0	0 0 0
+15 mins.	0 0 0	0 0 0	0 0 0
+30 mins.	0 0 0	0 0 0	0 0 0
+45 mins.	0 0 0	0 0 0	0 0 0
Total Volume	0 0 0	0 0 0	0 0 0
% App. Total	0 0	0 0	0 0
PHF	.000 .000 .000	.000 .000 .000	.000 .000 .000



**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0006  
 Site Code : 547J0006  
 Start Date : 9/25/2018  
 Page No : 1

**Groups Printed- Cars - Trucks**

	Cameron St From North		Hampden St From East		Hampden St From West		Int. Total	
	Start Time	Left	Right	Thru	Right	Left	Thru	
02:00 PM		1	4	20	3	2	12	42
02:15 PM		1	3	15	5	6	10	40
02:30 PM		2	1	35	17	12	13	80
02:45 PM		0	2	28	22	27	8	87
Total		4	10	98	47	47	43	249
03:00 PM		0	0	34	8	6	10	58
03:15 PM		0	4	34	4	2	16	60
03:30 PM		1	2	31	2	1	14	51
03:45 PM		4	5	26	5	2	9	51
Total		5	11	125	19	11	49	220
Grand Total		9	21	223	66	58	92	469
Apprch %		30	70	77.2	22.8	38.7	61.3	
Total %		1.9	4.5	47.5	14.1	12.4	19.6	
Cars		9	20	223	64	57	92	465
% Cars		100	95.2	100	97	98.3	100	99.1
Trucks		0	1	0	2	1	0	4
% Trucks		0	4.8	0	3	1.7	0	0.9

**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Rain

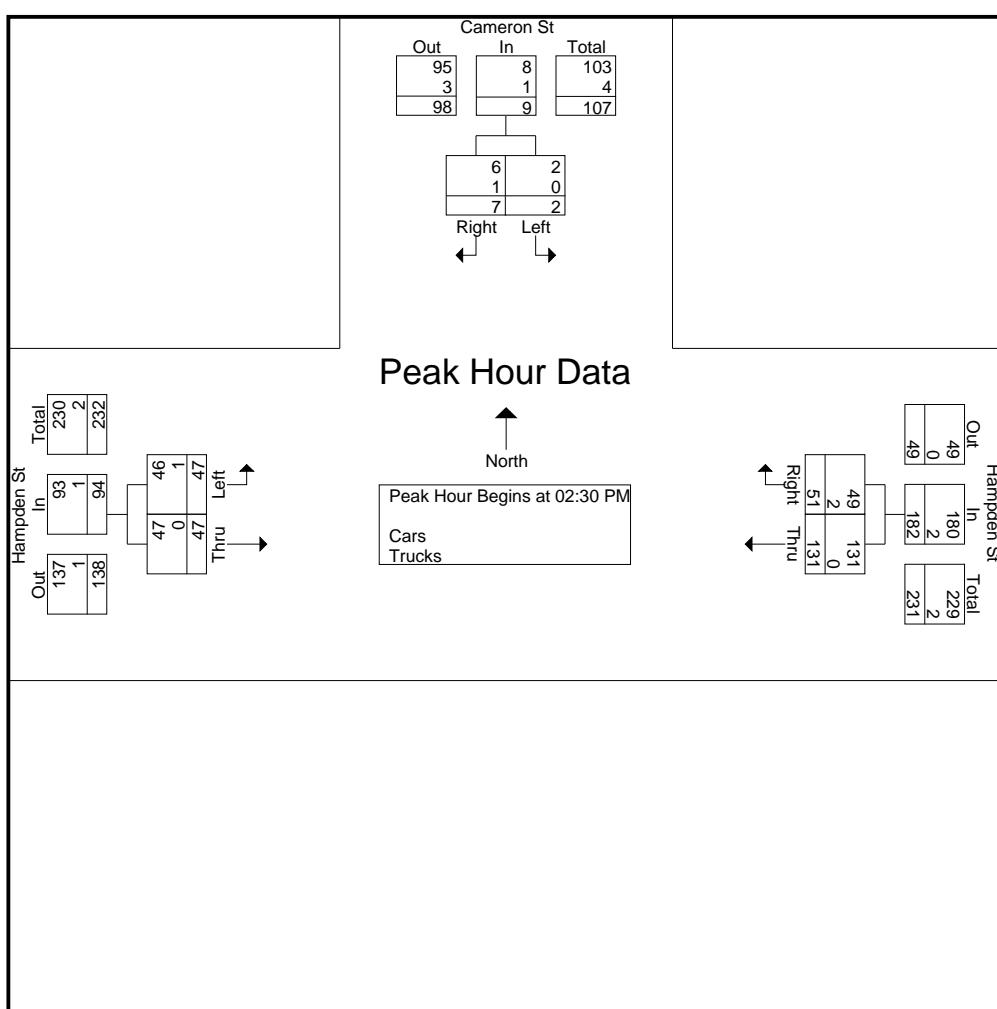
File Name : 547J0006  
 Site Code : 547J0006  
 Start Date : 9/25/2018  
 Page No : 2

	Cameron St			Hampden St			Hampden St			
	From North			From East			From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 02:30 PM

02:30 PM	2	1	3	35	17	52	12	13	25	80
02:45 PM	0	2	2	28	22	50	27	8	35	87
03:00 PM	0	0	0	34	8	42	6	10	16	58
03:15 PM	0	4	4	34	4	38	2	16	18	60
Total Volume	2	7	9	131	51	182	47	47	94	285
% App. Total	22.2	77.8		72	28		50	50		
PHF	.250	.438	.563	.936	.580	.875	.435	.734	.671	.819
Cars	2	6	8	131	49	180	46	47	93	281
% Cars	100	85.7	88.9	100	96.1	98.9	97.9	100	98.9	98.6
Trucks	0	1	1	0	2	2	1	0	1	4
% Trucks	0	14.3	11.1	0	3.9	1.1	2.1	0	1.1	1.4



**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Rain

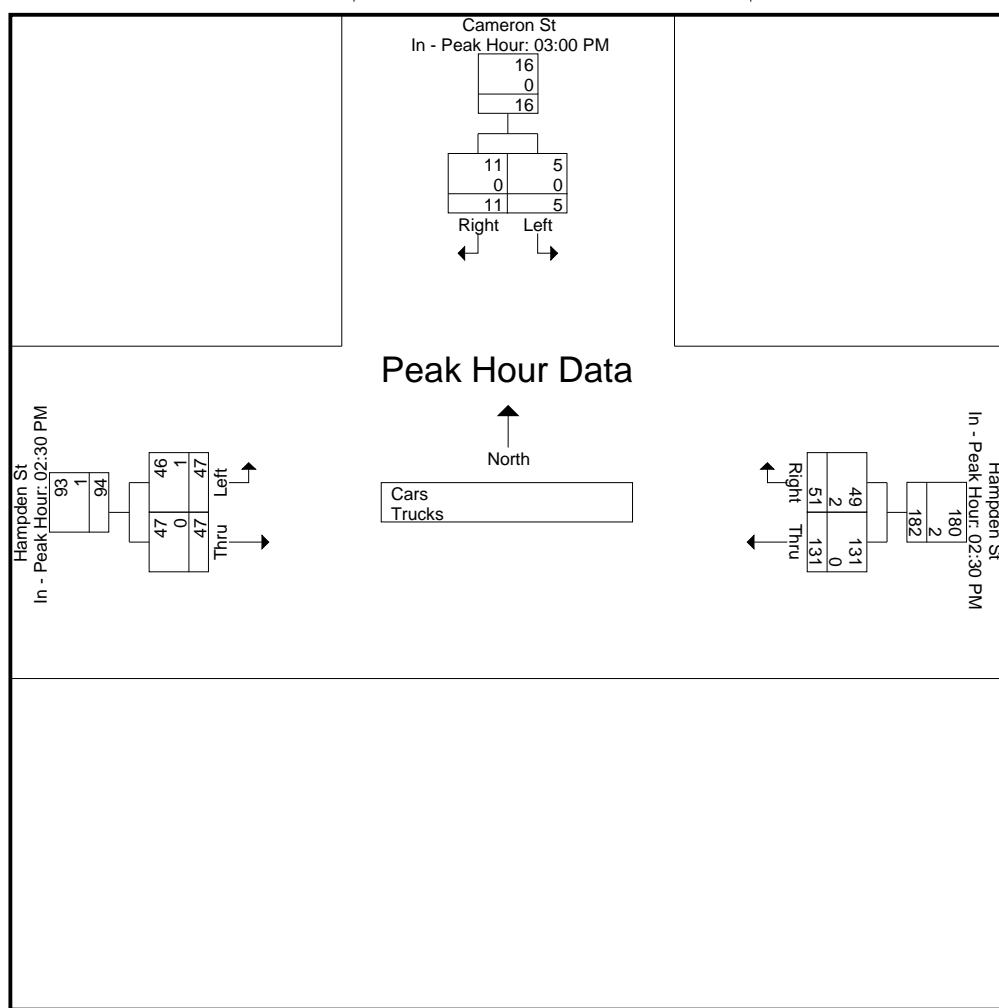
File Name : 547J0006  
 Site Code : 547J0006  
 Start Date : 9/25/2018  
 Page No : 3

	Cameron St From North			Hampden St From East			Hampden St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	03:00 PM			02:30 PM			02:30 PM			
+0 mins.	0	0	0	35	17	52	12	13	25	
+15 mins.	0	4	4	28	22	50	27	8	35	
+30 mins.	1	2	3	34	8	42	6	10	16	
+45 mins.	4	5	9	34	4	38	2	16	18	
Total Volume	5	11	16	131	51	182	47	47	94	
% App. Total	31.2	68.8		72	28		50	50		
PHF	.313	.550	.444	.936	.580	.875	.435	.734	.671	
Cars	5	11	16	131	49	180	46	47	93	
% Cars	100	100	100	100	96.1	98.9	97.9	100	98.9	
Trucks	0	0	0	0	2	2	1	0	1	
% Trucks	0	0	0	0	3.9	1.1	2.1	0	1.1	



**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0006  
 Site Code : 547J0006  
 Start Date : 9/25/2018  
 Page No : 4

**Groups Printed- Cars**

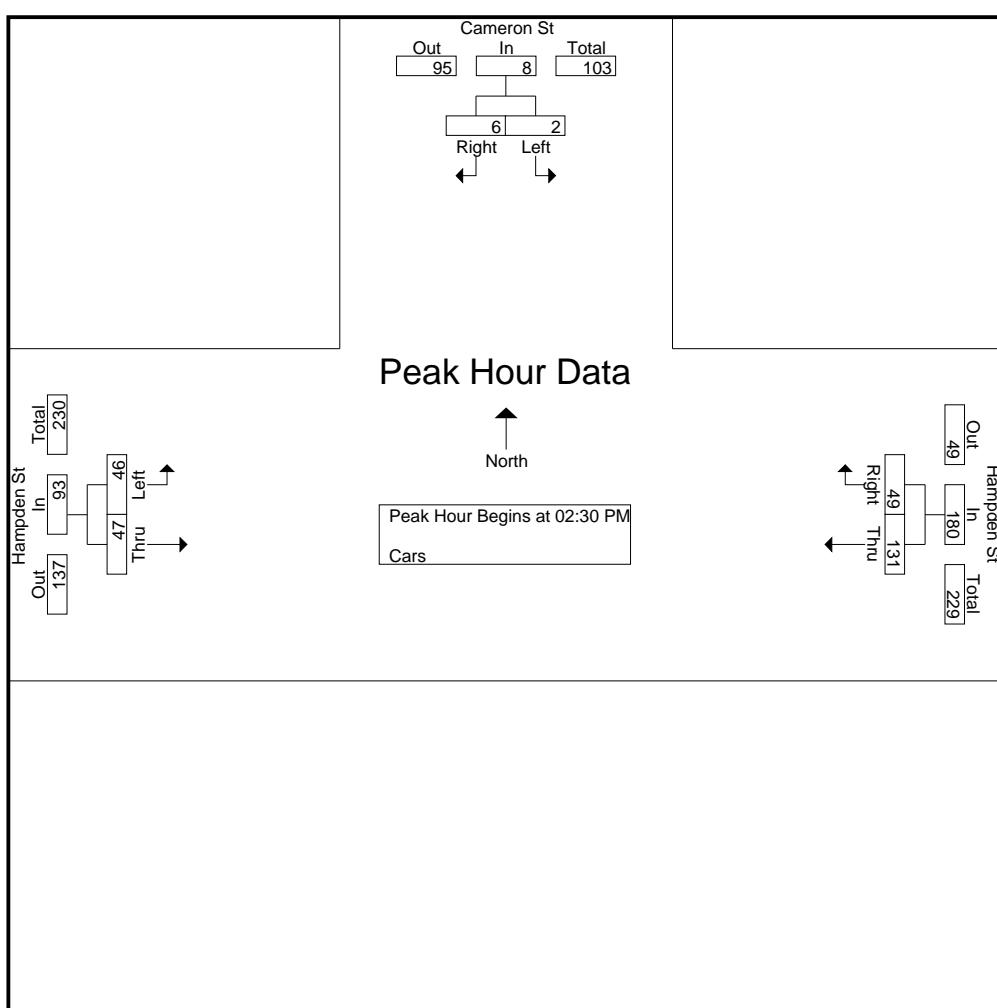
	Cameron St From North		Hampden St From East		Hampden St From West		Int. Total	
	Start Time	Left	Right	Thru	Right	Left	Thru	
02:00 PM		1	4	20	3	2	12	42
02:15 PM		1	3	15	5	6	10	40
02:30 PM		2	1	35	17	12	13	80
02:45 PM		0	1	28	21	27	8	85
Total		4	9	98	46	47	43	247
03:00 PM		0	0	34	8	5	10	57
03:15 PM		0	4	34	3	2	16	59
03:30 PM		1	2	31	2	1	14	51
03:45 PM		4	5	26	5	2	9	51
Total		5	11	125	18	10	49	218
Grand Total		9	20	223	64	57	92	465
Apprch %		31	69	77.7	22.3	38.3	61.7	
Total %		1.9	4.3	48	13.8	12.3	19.8	

**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0006  
 Site Code : 547J0006  
 Start Date : 9/25/2018  
 Page No : 5

	Cameron St			Hampden St			Hampden St			
	From North			From East			From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:30 PM										
02:30 PM	2	1	3	35	17	52	12	13	25	80
02:45 PM	0	1	1	28	21	49	27	8	35	85
03:00 PM	0	0	0	34	8	42	5	10	15	57
03:15 PM	0	4	4	34	3	37	2	16	18	59
Total Volume	2	6	8	131	49	180	46	47	93	281
% App. Total	25	75		72.8	27.2		49.5	50.5		
PHF	.250	.375	.500	.936	.583	.865	.426	.734	.664	.826



**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Rain

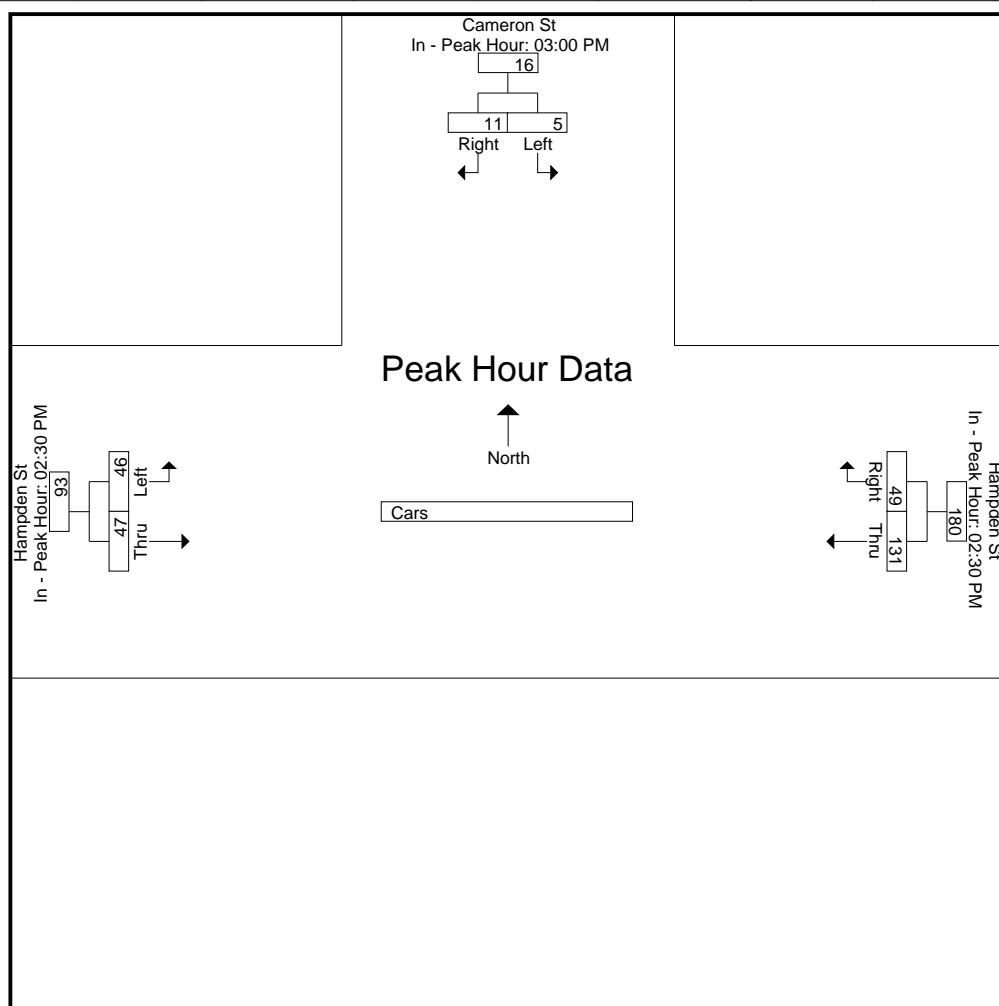
File Name : 547J0006  
 Site Code : 547J0006  
 Start Date : 9/25/2018  
 Page No : 6

	Cameron St			Hampden St			Hampden St			
	From North			From East			From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	03:00 PM	02:30 PM			02:30 PM		
+0 mins.	0	0	0	35	17	52	12
+15 mins.	0	4	4	28	21	49	27
+30 mins.	1	2	3	34	8	42	5
+45 mins.	4	5	9	34	3	37	2
Total Volume	5	11	16	131	49	180	46
% App. Total	31.2	68.8		72.8	27.2		49.5
PHF	.313	.550	.444	.936	.583	.865	.426
							.734
							.664



**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0006  
 Site Code : 547J0006  
 Start Date : 9/25/2018  
 Page No : 7

**Groups Printed- Trucks**

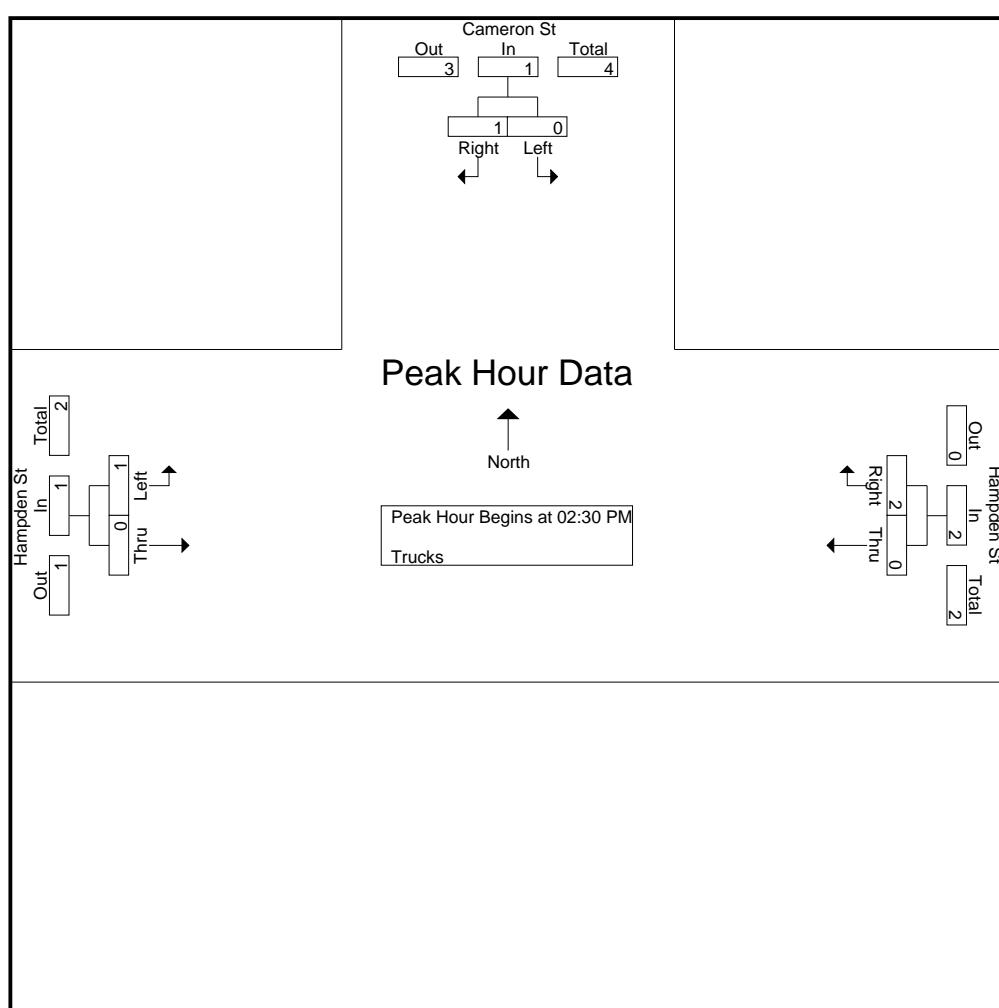
	Cameron St From North		Hampden St From East		Hampden St From West		Int. Total	
	Start Time	Left	Right	Thru	Right	Left	Thru	
02:00 PM		0	0	0	0	0	0	0
02:15 PM		0	0	0	0	0	0	0
02:30 PM		0	0	0	0	0	0	0
02:45 PM		0	1	0	1	0	0	2
Total		0	1	0	1	0	0	2
03:00 PM		0	0	0	0	1	0	1
03:15 PM		0	0	0	1	0	0	1
03:30 PM		0	0	0	0	0	0	0
03:45 PM		0	0	0	0	0	0	0
Total		0	0	0	1	1	0	2
Grand Total		0	1	0	2	1	0	4
Apprch %		0	100	0	100	100	0	
Total %		0	25	0	50	25	0	

**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0006  
 Site Code : 547J0006  
 Start Date : 9/25/2018  
 Page No : 8

	Cameron St			Hampden St			Hampden St			
	From North			From East			From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:30 PM										
02:30 PM	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	1	1	0	1	1	0	0	0	2
03:00 PM	0	0	0	0	0	0	1	0	1	1
03:15 PM	0	0	0	0	1	1	0	0	0	1
Total Volume	0	1	1	0	2	2	1	0	1	4
% App. Total	0	100		0	100		100	0		
PHF	.000	.250	.250	.000	.500	.500	.250	.000	.250	.500



**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Rain

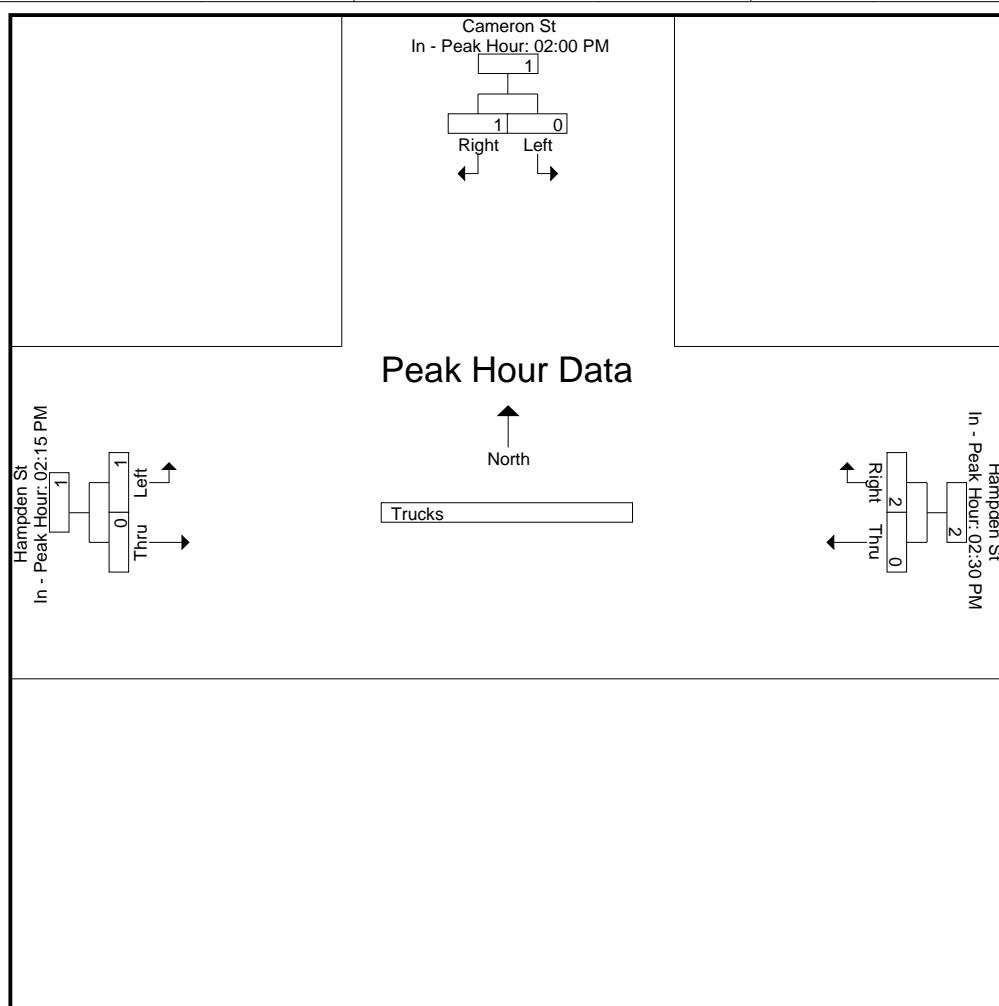
File Name : 547J0006  
 Site Code : 547J0006  
 Start Date : 9/25/2018  
 Page No : 9

	Cameron St From North			Hampden St From East			Hampden St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	02:00 PM		02:30 PM		02:15 PM	
+0 mins.	0	0	0	0	0	0
+15 mins.	0	0	0	0	1	1
+30 mins.	0	0	0	0	0	0
+45 mins.	0	1	1	0	1	1
Total Volume	0	1	1	0	2	2
% App. Total	0	100		0	100	
PHF	.000	.250	.250	.000	.500	.500
					.250	.000
						.250



**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0006  
 Site Code : 547J0006  
 Start Date : 9/25/2018  
 Page No : 10

**Groups Printed- Bikes Peds**

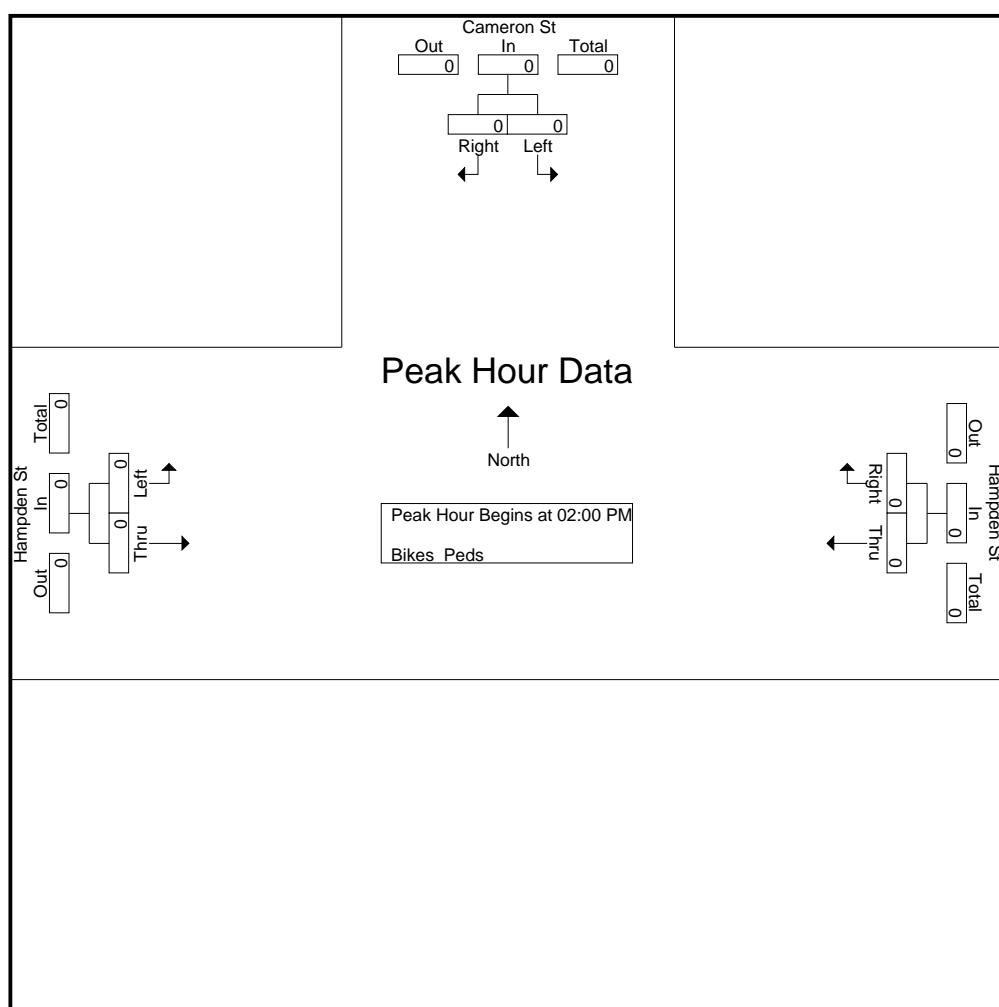
	Cameron St From North			Hampden St From East			Hampden St From West						
	Start Time	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds	Excl. Total	Incl. Total	Int. Total
02:00 PM		0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM		0	0	0	0	0	1	0	0	0	1	0	1
02:30 PM		0	0	0	0	0	2	0	0	1	3	0	3
02:45 PM		0	0	0	0	0	2	0	0	0	2	0	2
Total		0	0	0	0	0	5	0	0	1	6	0	6
03:00 PM		0	0	3	0	0	9	0	0	0	12	0	12
03:15 PM		0	0	2	0	0	2	0	0	0	4	0	4
03:30 PM		0	0	0	0	0	1	0	0	0	1	0	1
03:45 PM		0	0	0	0	0	0	0	0	0	0	0	0
Total		0	0	5	0	0	12	0	0	0	17	0	17
Grand Total		0	0	5	0	0	17	0	0	1	23	0	23
Apprch %		0	0		0	0		0	0				
Total %											100	0	

**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0006  
 Site Code : 547J0006  
 Start Date : 9/25/2018  
 Page No : 11

	Cameron St			Hampden St			Hampden St			
	From North			From East			From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:00 PM										
02:00 PM	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000



**Accurate Counts**  
978-664-2565

N/S Street : Cameron Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Rain

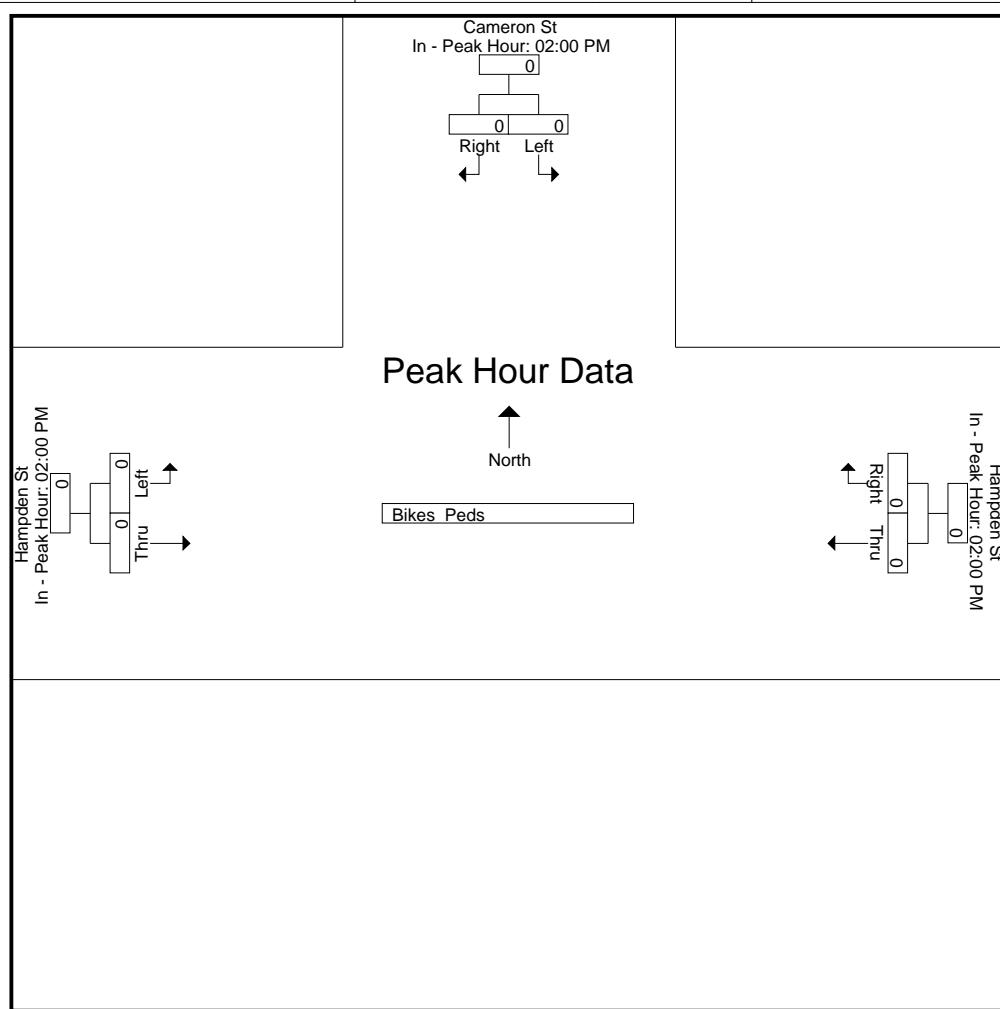
File Name : 547J0006  
 Site Code : 547J0006  
 Start Date : 9/25/2018  
 Page No : 12

	Cameron St From North			Hampden St From East			Hampden St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	02:00 PM	02:00 PM	02:00 PM
+0 mins.	0 0 0	0 0 0	0 0 0
+15 mins.	0 0 0	0 0 0	0 0 0
+30 mins.	0 0 0	0 0 0	0 0 0
+45 mins.	0 0 0	0 0 0	0 0 0
Total Volume	0 0 0	0 0 0	0 0 0
% App. Total	0 0	0 0	0 0
PHF	.000 .000 .000	.000 .000 .000	.000 .000 .000



**Accurate Counts**  
978-664-2565

N/S Street : Brook Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

File Name : 547J0007  
 Site Code : 547J0007  
 Start Date : 9/25/2018  
 Page No : 1

**Groups Printed- Cars - Trucks**

Start Time	Brook St From North		Brook St From South		Hamden St From West		Int. Total
	Thru	Right	Left	Thru	Left	Right	
07:00 AM	5	3	11	1	8	18	46
07:15 AM	5	5	17	8	22	35	92
07:30 AM	11	20	30	10	5	31	107
07:45 AM	10	33	50	16	20	19	148
Total	31	61	108	35	55	103	393
08:00 AM	3	11	26	12	36	22	110
08:15 AM	19	8	54	8	19	39	147
08:30 AM	7	5	10	6	14	21	63
08:45 AM	6	9	20	4	14	18	71
Total	35	33	110	30	83	100	391
Grand Total	66	94	218	65	138	203	784
Apprch %	41.2	58.8	77	23	40.5	59.5	
Total %	8.4	12	27.8	8.3	17.6	25.9	
Cars	64	93	217	65	138	202	779
% Cars	97	98.9	99.5	100	100	99.5	99.4
Trucks	2	1	1	0	0	1	5
% Trucks	3	1.1	0.5	0	0	0.5	0.6

# **Accurate Counts**

978-664-2565

N/S Street : Brook Street  
E/W Street: Hamden Street  
City/State : Wellesley, MA  
Weather : Cloudy

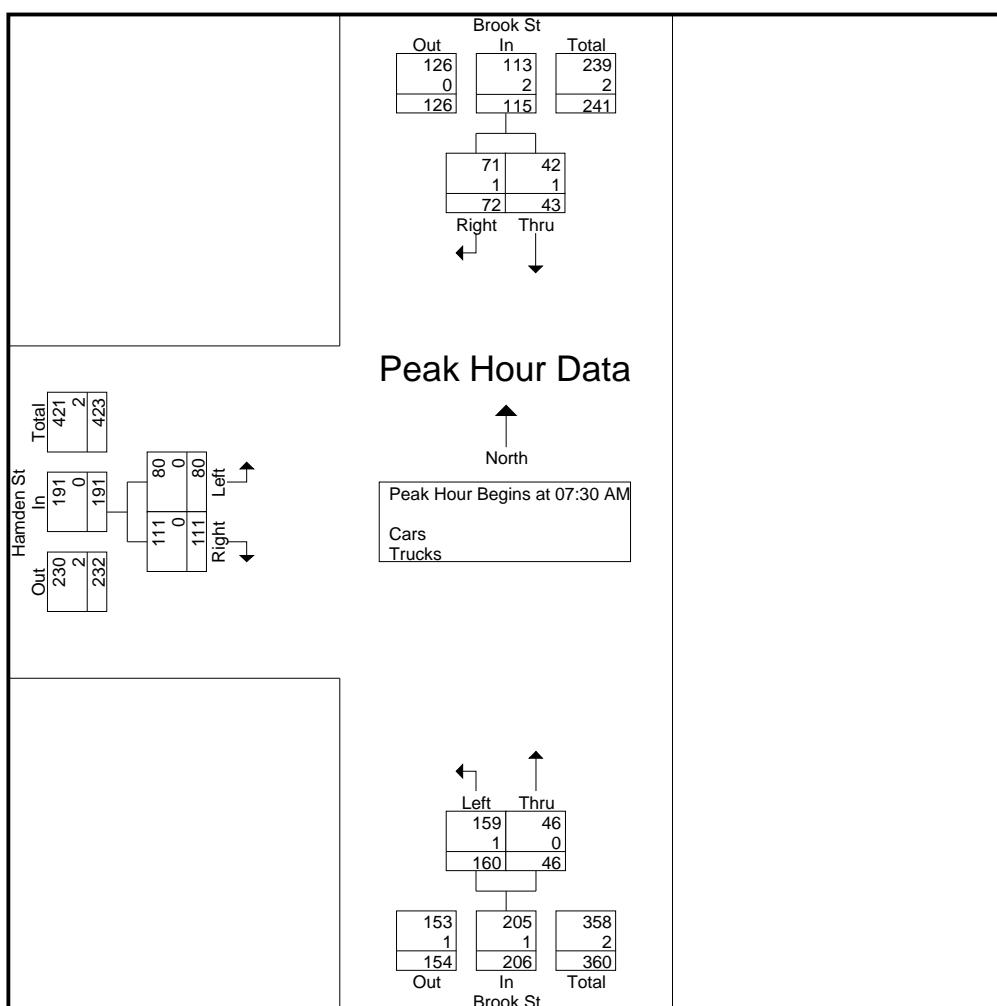
File Name : 547J0007  
Site Code : 547J0007  
Start Date : 9/25/2018  
Page No : 2

	Brook St From North			Brook St From South			Hamden St From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:30 AM

07:30 AM	11	20	31	30	10	40	5	31	36	107
07:45 AM	10	33	43	50	16	66	20	19	39	148
08:00 AM	3	11	14	26	12	38	36	22	58	110
08:15 AM	19	8	27	54	8	62	19	39	58	147
Total Volume	43	72	115	160	46	206	80	111	191	512
% App. Total	37.4	62.6		77.7	22.3		41.9	58.1		
PHF	.566	.545	.669	.741	.719	.780	.556	.712	.823	.865
Cars	42	71	113	159	46	205	80	111	191	509
% Cars	97.7	98.6	98.3	99.4	100	99.5	100	100	100	99.4
Trucks	1	1	2	1	0	1	0	0	0	3
% Trucks	2.3	1.4	1.7	0.6	0	0.5	0	0	0	0.6



**Accurate Counts**  
978-664-2565

N/S Street : Brook Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

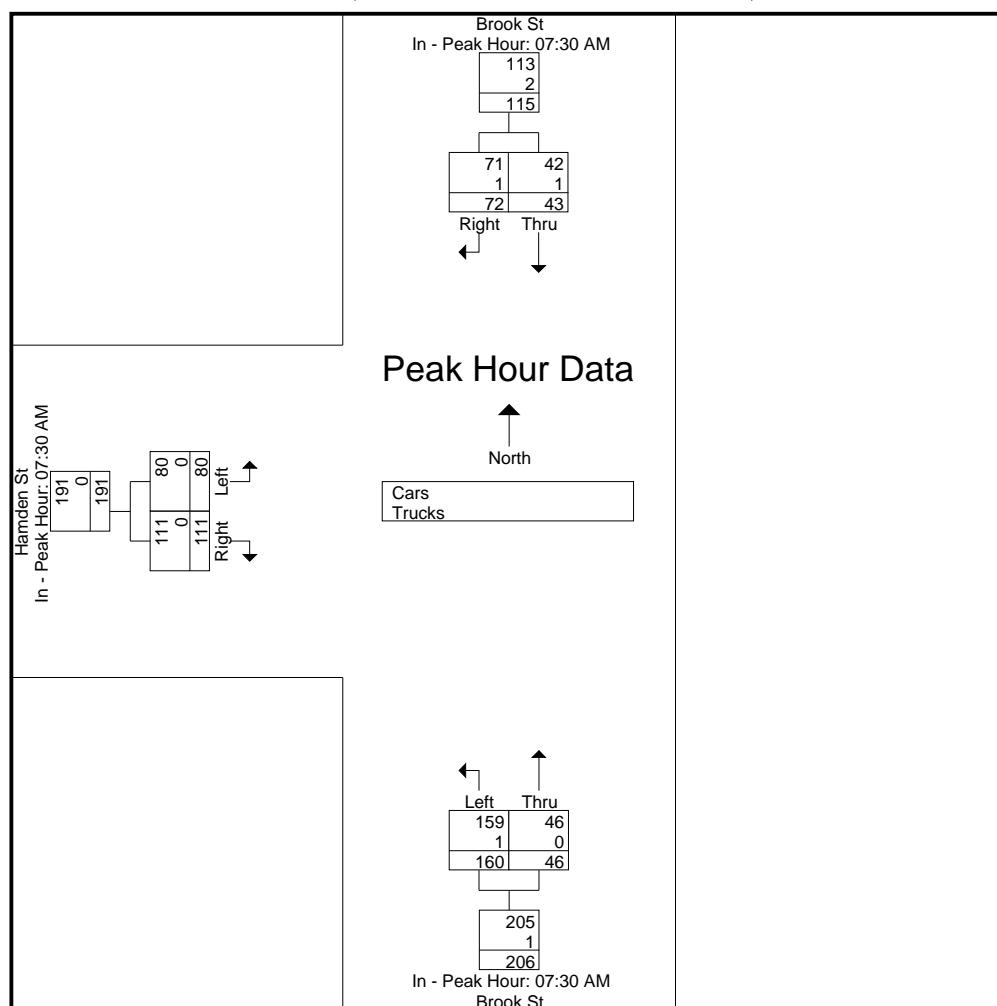
File Name : 547J0007  
 Site Code : 547J0007  
 Start Date : 9/25/2018  
 Page No : 3

	Brook St From North			Brook St From South			Hamden St From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:30 AM		07:30 AM		07:30 AM	
+0 mins.	11	20	31	30	10	40
+15 mins.	10	33	43	50	16	66
+30 mins.	3	11	14	26	12	38
+45 mins.	19	8	27	54	8	62
Total Volume	43	72	115	160	46	206
% App. Total	37.4	62.6		77.7	22.3	
PHF	.566	.545	.669	.741	.719	.780
Cars	42	71	113	159	46	205
% Cars	97.7	98.6	98.3	99.4	100	99.5
Trucks	1	1	2	1	0	1
% Trucks	2.3	1.4	1.7	0.6	0	0.5



**Accurate Counts**  
978-664-2565

N/S Street : Brook Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

File Name : 547J0007  
 Site Code : 547J0007  
 Start Date : 9/25/2018  
 Page No : 4

**Groups Printed- Cars**

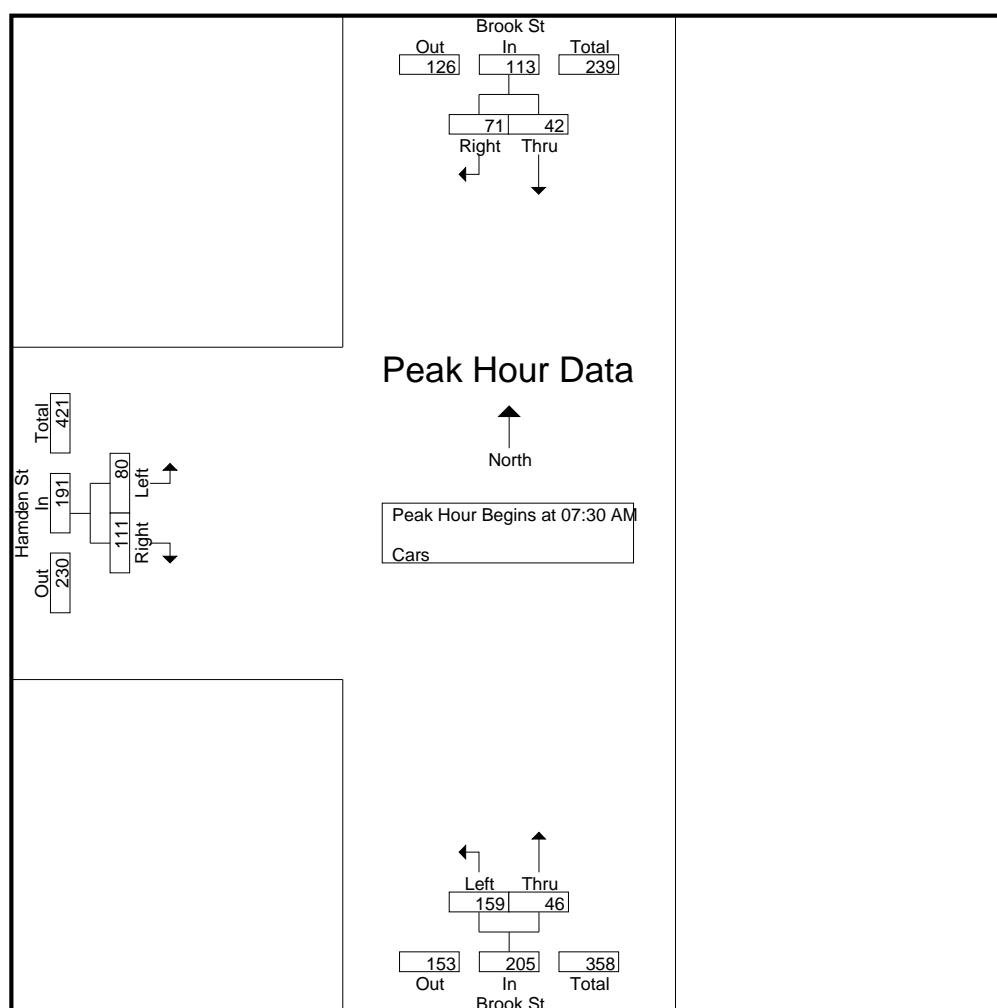
	Brook St From North		Brook St From South		Hamden St From West		Int. Total	
	Start Time	Thru	Right	Left	Thru	Left	Right	
07:00 AM		5	3	11	1	8	18	46
07:15 AM		4	5	17	8	22	34	90
07:30 AM		10	20	30	10	5	31	106
07:45 AM		10	32	50	16	20	19	147
Total		29	60	108	35	55	102	389
08:00 AM		3	11	25	12	36	22	109
08:15 AM		19	8	54	8	19	39	147
08:30 AM		7	5	10	6	14	21	63
08:45 AM		6	9	20	4	14	18	71
Total		35	33	109	30	83	100	390
Grand Total		64	93	217	65	138	202	779
Apprch %		40.8	59.2	77	23	40.6	59.4	
Total %		8.2	11.9	27.9	8.3	17.7	25.9	

**Accurate Counts**  
978-664-2565

N/S Street : Brook Street  
E/W Street: Hamden Street  
City/State : Wellesley, MA  
Weather : Cloudy

File Name : 547J0007  
Site Code : 547J0007  
Start Date : 9/25/2018  
Page No : 5

	Brook St			Brook St			Hamden St			
	From North			From South			From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	10	20	30	30	10	40	5	31	36	106
07:45 AM	10	32	42	50	16	66	20	19	39	147
08:00 AM	3	11	14	25	12	37	36	22	58	109
08:15 AM	19	8	27	54	8	62	19	39	58	147
Total Volume	42	71	113	159	46	205	80	111	191	509
% App. Total	37.2	62.8		77.6	22.4		41.9	58.1		
PHF	.553	.555	.673	.736	.719	.777	.556	.712	.823	.866



# **Accurate Counts**

978-664-2565

N/S Street : Brook Street  
E/W Street: Hamden Street  
City/State : Wellesley, MA  
Weather : Cloudy

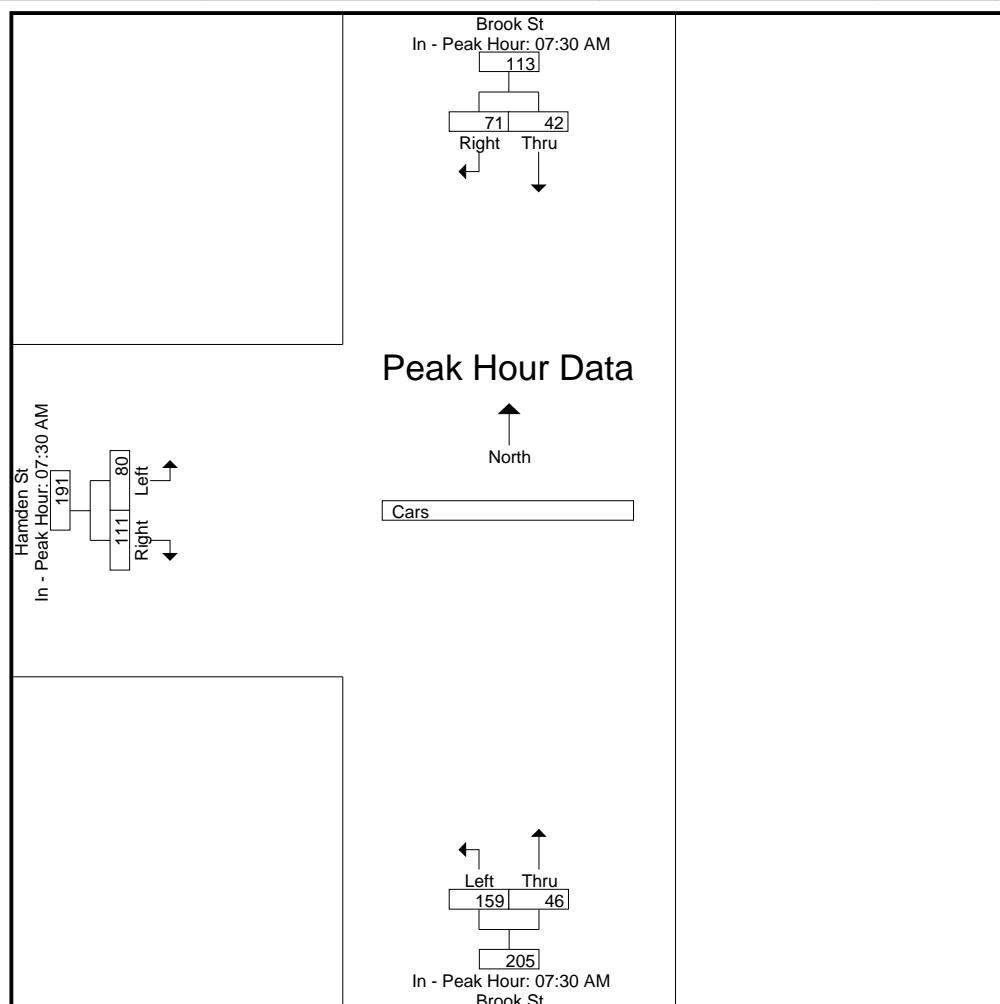
File Name : 547J0007  
Site Code : 547J0007  
Start Date : 9/25/2018  
Page No : 6

	Brook St From North			Brook St From South			Hamden St From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:30 AM			07:30 AM			07:30 AM		
+0 mins.	10	20	30	30	10	40	5	31	36
+15 mins.	10	<b>32</b>	<b>42</b>	50	<b>16</b>	<b>66</b>	20	19	39
+30 mins.	3	11	14	25	12	37	<b>36</b>	22	<b>58</b>
+45 mins.	<b>19</b>	8	27	<b>54</b>	8	62	19	<b>39</b>	58
Total Volume	42	71	113	159	46	205	80	111	191
% App. Total	37.2	62.8		77.6	22.4		41.9	58.1	
PHF	.553	.555	.673	.736	.719	.777	.556	.712	.823



**Accurate Counts**  
978-664-2565

N/S Street : Brook Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

File Name : 547J0007  
 Site Code : 547J0007  
 Start Date : 9/25/2018  
 Page No : 7

**Groups Printed- Trucks**

	Brook St From North		Brook St From South		Hamden St From West		Int. Total
	Thru	Right	Left	Thru	Left	Right	
Start Time							
07:00 AM	0	0	0	0	0	0	0
07:15 AM	1	0	0	0	0	1	2
07:30 AM	1	0	0	0	0	0	1
07:45 AM	0	1	0	0	0	0	1
Total	2	1	0	0	0	1	4
08:00 AM	0	0	1	0	0	0	1
08:15 AM	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0
Total	0	0	1	0	0	0	1
Grand Total	2	1	1	0	0	1	5
Apprch %	66.7	33.3	100	0	0	100	
Total %	40	20	20	0	0	20	

**Accurate Counts**  
978-664-2565

N/S Street : Brook Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

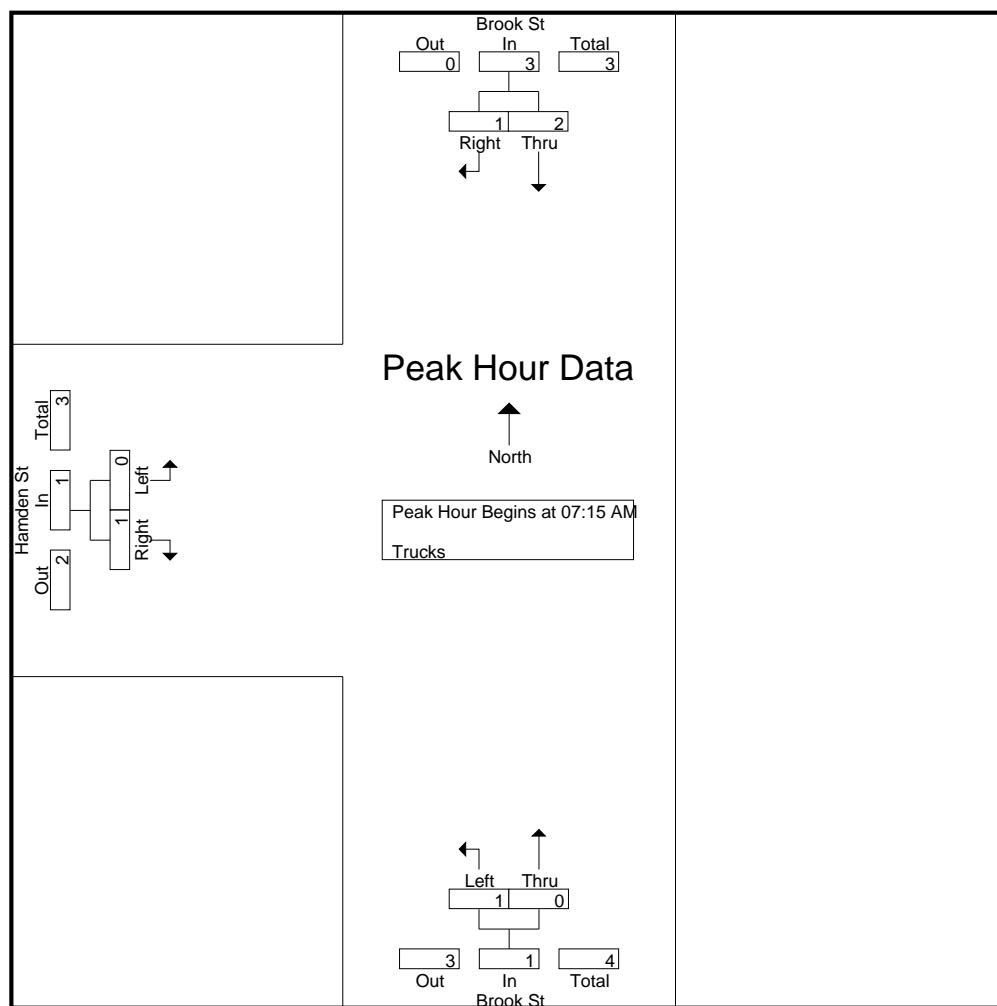
File Name : 547J0007  
 Site Code : 547J0007  
 Start Date : 9/25/2018  
 Page No : 8

	Brook St			Brook St			Hamden St			
	From North			From South			From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:15 AM

07:15 AM	1	0	1	0	0	0	0	1	1	2
07:30 AM	1	0	1	0	0	0	0	0	0	1
07:45 AM	0	1	1	0	0	0	0	0	0	1
08:00 AM	0	0	0	1	0	1	0	0	0	1
Total Volume	2	1	3	1	0	1	0	1	1	5
% App. Total	66.7	33.3		100	0		0	100		
PHF	.500	.250	.750	.250	.000	.250	.000	.250	.250	.625



**Accurate Counts**  
978-664-2565

N/S Street : Brook Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

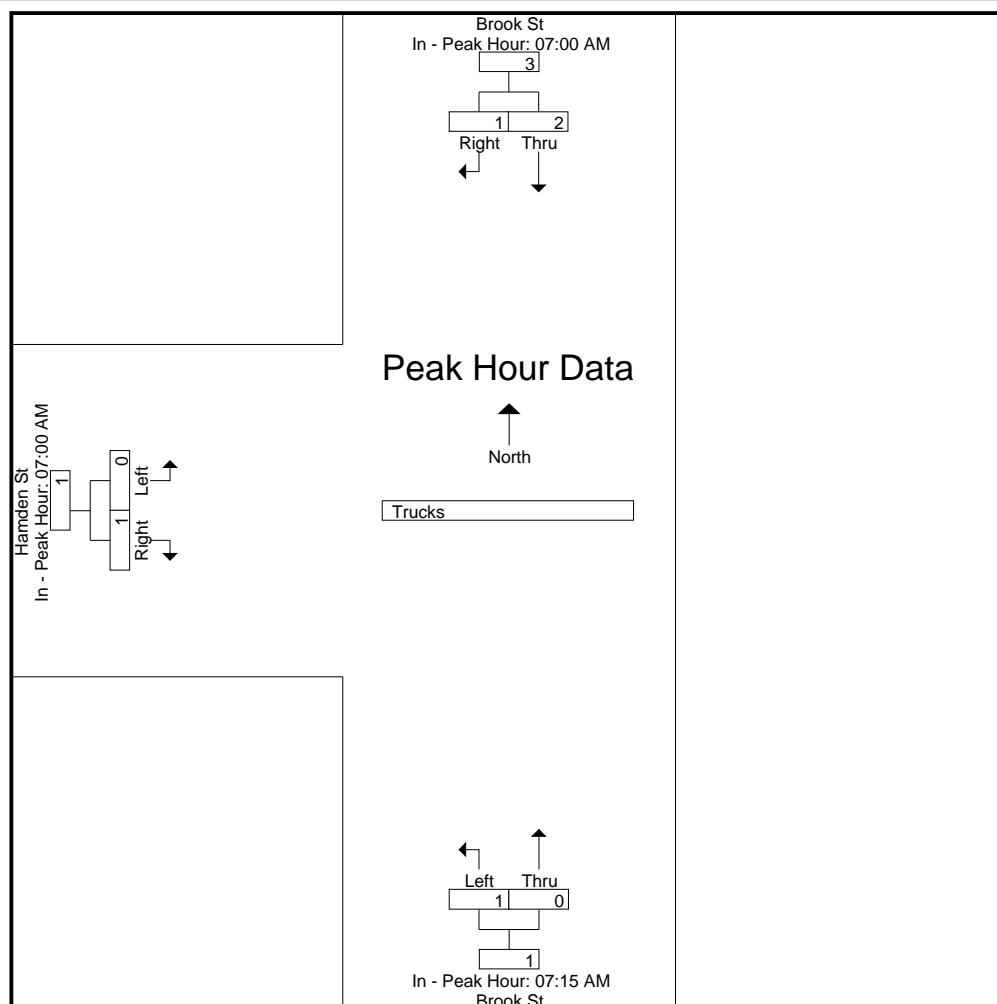
File Name : 547J0007  
 Site Code : 547J0007  
 Start Date : 9/25/2018  
 Page No : 9

	Brook St From North			Brook St From South			Hamden St From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM		07:15 AM		07:00 AM					
+0 mins.	0	0	0	0	0	0	0	0	0	0
+15 mins.	1	0	1	0	0	0	0	1	1	1
+30 mins.	1	0	1	0	0	0	0	0	0	0
+45 mins.	0	1	1	1	0	1	0	0	0	0
Total Volume	2	1	3	1	0	1	0	1	1	1
% App. Total	66.7	33.3		100	0		0	100		
PHF	.500	.250	.750	.250	.000	.250	.000	.250	.250	



**Accurate Counts**  
978-664-2565

N/S Street : Brook Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

File Name : 547J0007  
 Site Code : 547J0007  
 Start Date : 9/25/2018  
 Page No : 10

**Groups Printed- Bikes Peds**

	Brook St From North			Brook St From South			Hamden St From West						
	Start Time	Thru	Right	Peds	Left	Thru	Peds	Left	Right	Peds	Excl. Total	Inclu. Total	Int. Total
07:00 AM		0	0	0	0	2	2	0	0	0	2	2	4
07:15 AM		0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM		0	0	0	0	0	0	0	0	1	1	0	1
07:45 AM		0	0	0	0	0	0	0	0	0	0	0	0
Total		0	0	0	0	2	2	0	0	1	3	2	5
08:00 AM		0	0	0	0	0	0	0	0	2	2	0	2
08:15 AM		0	0	0	0	0	0	0	0	6	6	0	6
08:30 AM		0	0	0	0	0	0	0	0	2	2	0	2
08:45 AM		0	0	0	0	0	0	0	0	0	0	0	0
Total		0	0	0	0	0	0	0	0	10	10	0	10
Grand Total		0	0	0	0	2	2	0	0	11	13	2	15
Apprch %		0	0		0	100		0	0				
Total %		0	0		0	100		0	0		86.7	13.3	

**Accurate Counts**  
978-664-2565

N/S Street : Brook Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

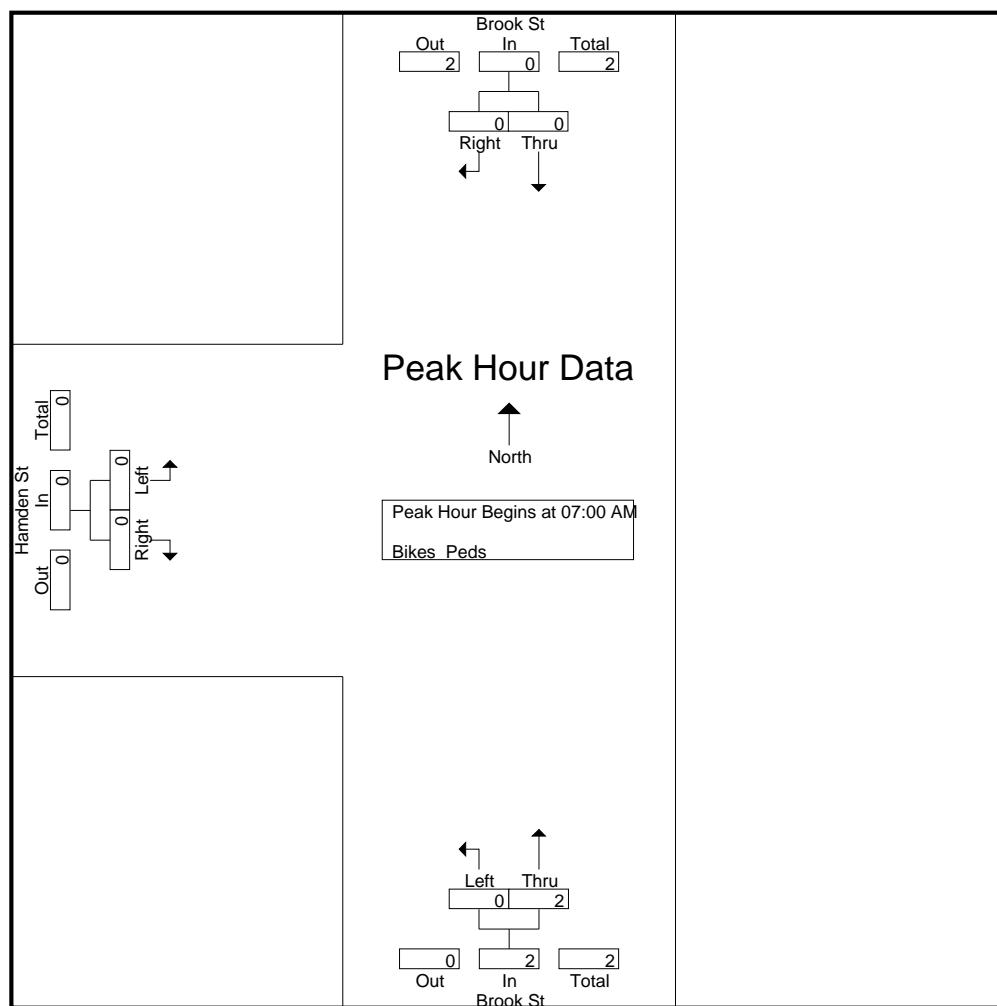
File Name : 547J0007  
 Site Code : 547J0007  
 Start Date : 9/25/2018  
 Page No : 11

	Brook St			Brook St			Hamden St			
	From North			From South			From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:00 AM

07:00 AM	0	0	0	0	2	2	0	0	0	2
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	2	2	0	0	0	2
% App. Total	0	0		0	100		0	0		
PHF	.000	.000	.000	.000	.250	.250	.000	.000	.000	.250



**Accurate Counts**  
978-664-2565

N/S Street : Brook Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Cloudy

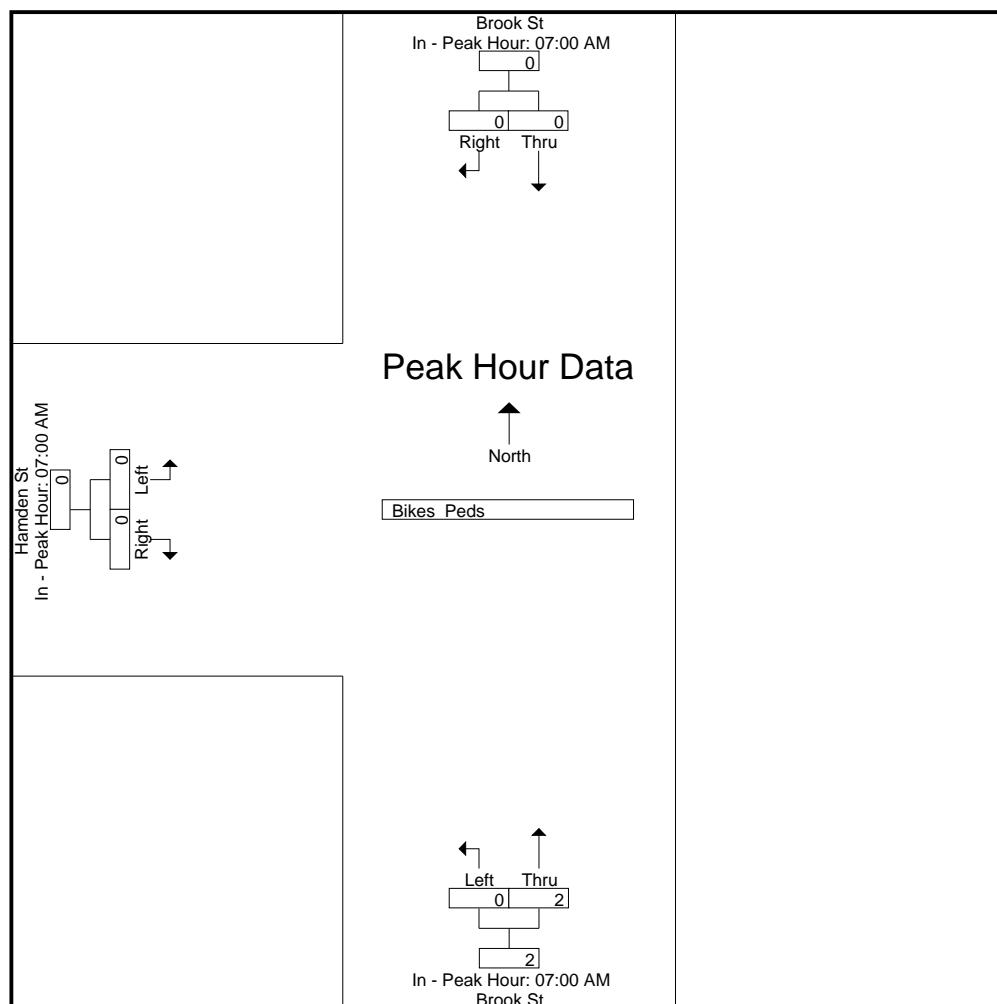
File Name : 547J0007  
 Site Code : 547J0007  
 Start Date : 9/25/2018  
 Page No : 12

	Brook St From North			Brook St From South			Hamden St From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM		07:00 AM		07:00 AM	
+0 mins.	0	0	0	0	2	2
+15 mins.	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0
Total Volume	0	0	0	0	2	2
% App. Total	0	0		0	100	
PHF	.000	.000	.000	.000	.250	.250



**Accurate Counts**  
978-664-2565

N/S Street : Brook Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0007  
 Site Code : 547J0007  
 Start Date : 9/25/2018  
 Page No : 1

**Groups Printed- Cars - Trucks**

Start Time	Brook St From North		Brook St From South		Hamden St From West		Int. Total
	Thru	Right	Left	Thru	Left	Right	
02:00 PM	5	9	14	4	6	9	47
02:15 PM	5	7	11	7	5	6	41
02:30 PM	6	18	29	8	5	11	77
02:45 PM	13	10	38	4	3	3	71
Total	29	44	92	23	19	29	236
03:00 PM	15	10	31	6	2	6	70
03:15 PM	14	13	25	6	6	11	75
03:30 PM	5	14	16	9	8	5	57
03:45 PM	6	9	21	13	5	8	62
Total	40	46	93	34	21	30	264
Grand Total	69	90	185	57	40	59	500
Apprch %	43.4	56.6	76.4	23.6	40.4	59.6	
Total %	13.8	18	37	11.4	8	11.8	
Cars	69	88	185	57	40	59	498
% Cars	100	97.8	100	100	100	100	99.6
Trucks	0	2	0	0	0	0	2
% Trucks	0	2.2	0	0	0	0	0.4

**Accurate Counts**  
978-664-2565

N/S Street : Brook Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Rain

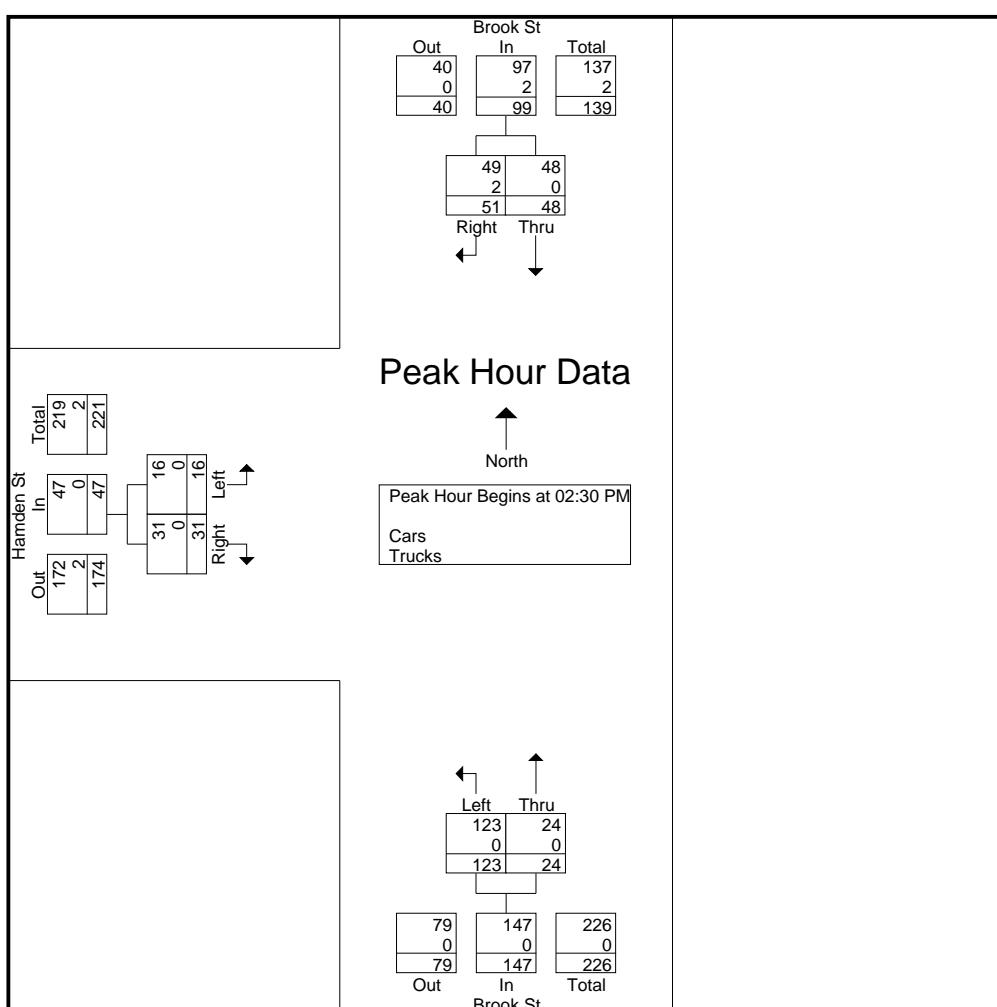
File Name : 547J0007  
 Site Code : 547J0007  
 Start Date : 9/25/2018  
 Page No : 2

	Brook St From North			Brook St From South			Hamden St From West			Int. Total
	Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 02:30 PM

02:30 PM	6	18	24	29	8	37	5	11	16	77
02:45 PM	13	10	23	38	4	42	3	3	6	71
03:00 PM	15	10	25	31	6	37	2	6	8	70
03:15 PM	14	13	27	25	6	31	6	11	17	75
Total Volume	48	51	99	123	24	147	16	31	47	293
% App. Total	48.5	51.5		83.7	16.3		34	66		
PHF	.800	.708	.917	.809	.750	.875	.667	.705	.691	.951
Cars	48	49	97	123	24	147	16	31	47	291
% Cars	100	96.1	98.0	100	100	100	100	100	100	99.3
Trucks	0	2	2	0	0	0	0	0	0	2
% Trucks	0	3.9	2.0	0	0	0	0	0	0	0.7



**Accurate Counts**  
978-664-2565

N/S Street : Brook Street  
E/W Street: Hamden Street  
City/State : Wellesley, MA  
Weather : Rain

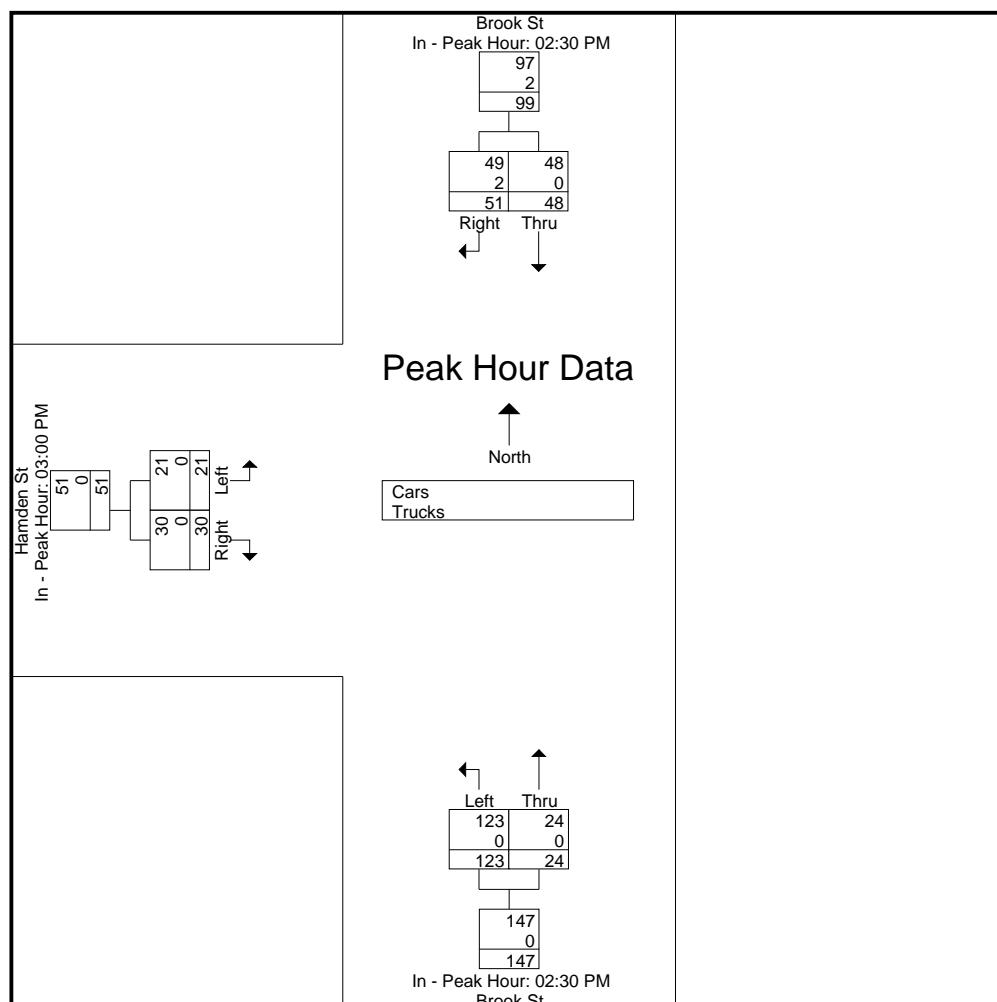
File Name : 547J0007  
Site Code : 547J0007  
Start Date : 9/25/2018  
Page No : 3

	Brook St From North			Brook St From South			Hamden St From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	02:30 PM			02:30 PM			03:00 PM			
+0 mins.	6	<b>18</b>	24	29	<b>8</b>	37	2	6	8	
+15 mins.	13	10	23	<b>38</b>	4	<b>42</b>	6	<b>11</b>	<b>17</b>	
+30 mins.	<b>15</b>	10	25	31	6	37	<b>8</b>	5	13	
+45 mins.	14	13	<b>27</b>	25	6	31	5	8	13	
Total Volume	48	51	99	123	24	147	21	30	51	
% App. Total	48.5	51.5		83.7	16.3		41.2	58.8		
PHF	.800	.708	.917	.809	.750	.875	.656	.682	.750	
Cars	48	49	97	123	24	147	21	30	51	
% Cars	100	96.1	98	100	100	100	100	100	100	
Trucks	0	2	2	0	0	0	0	0	0	
% Trucks	0	3.9	2	0	0	0	0	0	0	



**Accurate Counts**  
978-664-2565

N/S Street : Brook Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0007  
 Site Code : 547J0007  
 Start Date : 9/25/2018  
 Page No : 4

**Groups Printed- Cars**

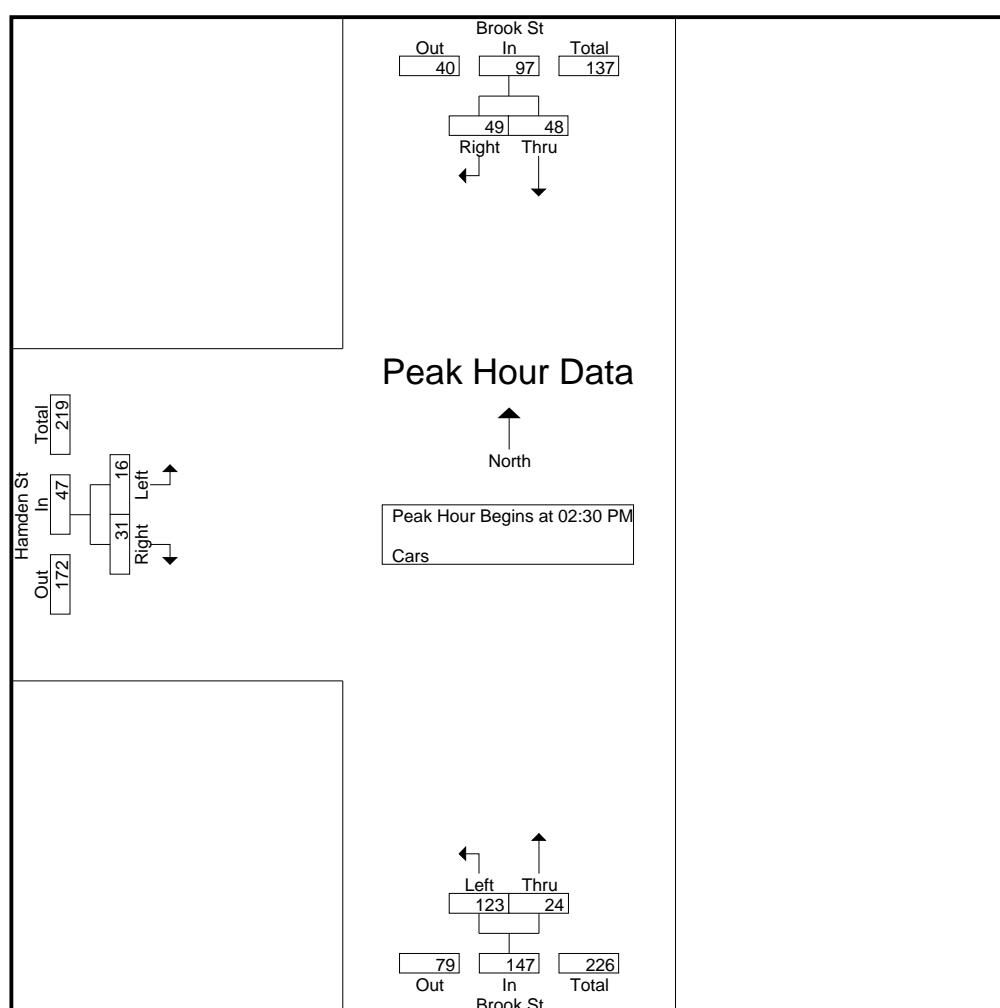
	Brook St From North		Brook St From South		Hamden St From West		Int. Total
	Thru	Right	Left	Thru	Left	Right	
Start Time							
02:00 PM	5	9	14	4	6	9	47
02:15 PM	5	7	11	7	5	6	41
02:30 PM	6	18	29	8	5	11	77
02:45 PM	13	9	38	4	3	3	70
Total	29	43	92	23	19	29	235
03:00 PM	15	10	31	6	2	6	70
03:15 PM	14	12	25	6	6	11	74
03:30 PM	5	14	16	9	8	5	57
03:45 PM	6	9	21	13	5	8	62
Total	40	45	93	34	21	30	263
Grand Total	69	88	185	57	40	59	498
Apprch %	43.9	56.1	76.4	23.6	40.4	59.6	
Total %	13.9	17.7	37.1	11.4	8	11.8	

**Accurate Counts**  
978-664-2565

N/S Street : Brook Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0007  
 Site Code : 547J0007  
 Start Date : 9/25/2018  
 Page No : 5

	Brook St From North			Brook St From South			Hamden St From West			Int. Total	
	Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1											
Peak Hour for Entire Intersection Begins at 02:30 PM											
02:30 PM	6	18	24		29	8	37	5	11	16	77
02:45 PM	13	9	22		38	4	42	3	3	6	70
03:00 PM	15	10	25		31	6	37	2	6	8	70
03:15 PM	14	12	26		25	6	31	6	11	17	74
Total Volume	48	49	97		123	24	147	16	31	47	291
% App. Total	49.5	50.5			83.7	16.3		34	66		
PHF	.800	.681	.933		.809	.750	.875	.667	.705	.691	.945



**Accurate Counts**  
978-664-2565

N/S Street : Brook Street  
E/W Street: Hamden Street  
City/State : Wellesley, MA  
Weather : Rain

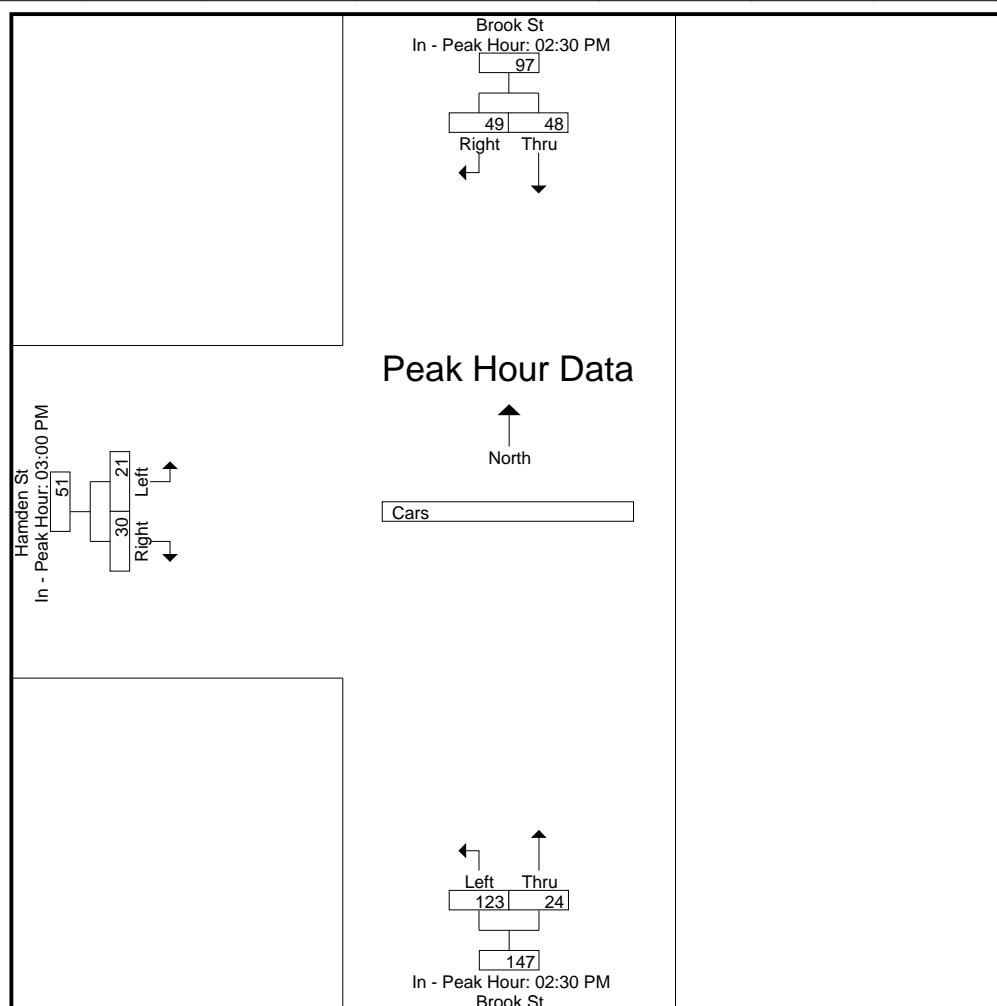
File Name : 547J0007  
Site Code : 547J0007  
Start Date : 9/25/2018  
Page No : 6

	Brook St From North			Brook St From South			Hamden St From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	02:30 PM	02:30 PM	03:00 PM
+0 mins.	6 <b>18</b> 24	29 <b>8</b> 37	2      6      8
+15 mins.	13      9      22	<b>38</b> 4 <b>42</b>	6 <b>11</b> <b>17</b>
+30 mins.	<b>15</b> 10      25	31      6      37	<b>8</b> 5      13
+45 mins.	14      12 <b>26</b>	25      6      31	5      8      13
Total Volume	48      49      97	123      24      147	21      30      51
% App. Total	49.5      50.5	83.7      16.3	41.2      58.8
PHF	.800      .681      .933	.809      .750      .875	.656      .682      .750



**Accurate Counts**  
978-664-2565

N/S Street : Brook Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0007  
 Site Code : 547J0007  
 Start Date : 9/25/2018  
 Page No : 7

**Groups Printed- Trucks**

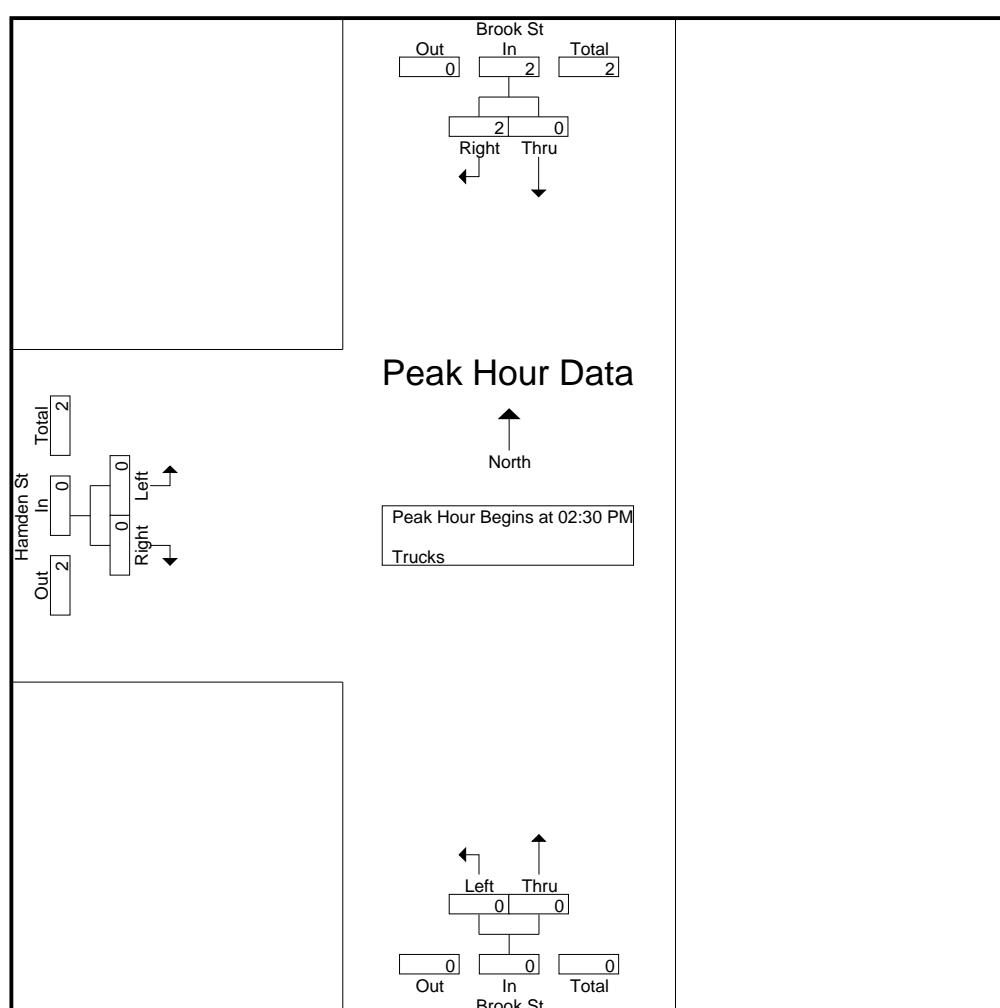
	Brook St From North		Brook St From South		Hamden St From West		Int. Total
	Thru	Right	Left	Thru	Left	Right	
Start Time							
02:00 PM	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0
02:45 PM	0	1	0	0	0	0	1
Total	0	1	0	0	0	0	1
03:00 PM	0	0	0	0	0	0	0
03:15 PM	0	1	0	0	0	0	1
03:30 PM	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0
Total	0	1	0	0	0	0	1
Grand Total	0	2	0	0	0	0	2
Apprch %	0	100	0	0	0	0	0
Total %	0	100	0	0	0	0	0

**Accurate Counts**  
978-664-2565

N/S Street : Brook Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0007  
 Site Code : 547J0007  
 Start Date : 9/25/2018  
 Page No : 8

	Brook St From North			Brook St From South			Hamden St From West			Int. Total
	Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:30 PM										
02:30 PM	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	1	1	1	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	1	1	1	0	0	0	0	0	1
Total Volume	0	2	2	2	0	0	0	0	0	2
% App. Total	0	100			0	0		0	0	
PHF	.000	.500	.500	.500	.000	.000	.000	.000	.000	.500



# **Accurate Counts**

978-664-2565

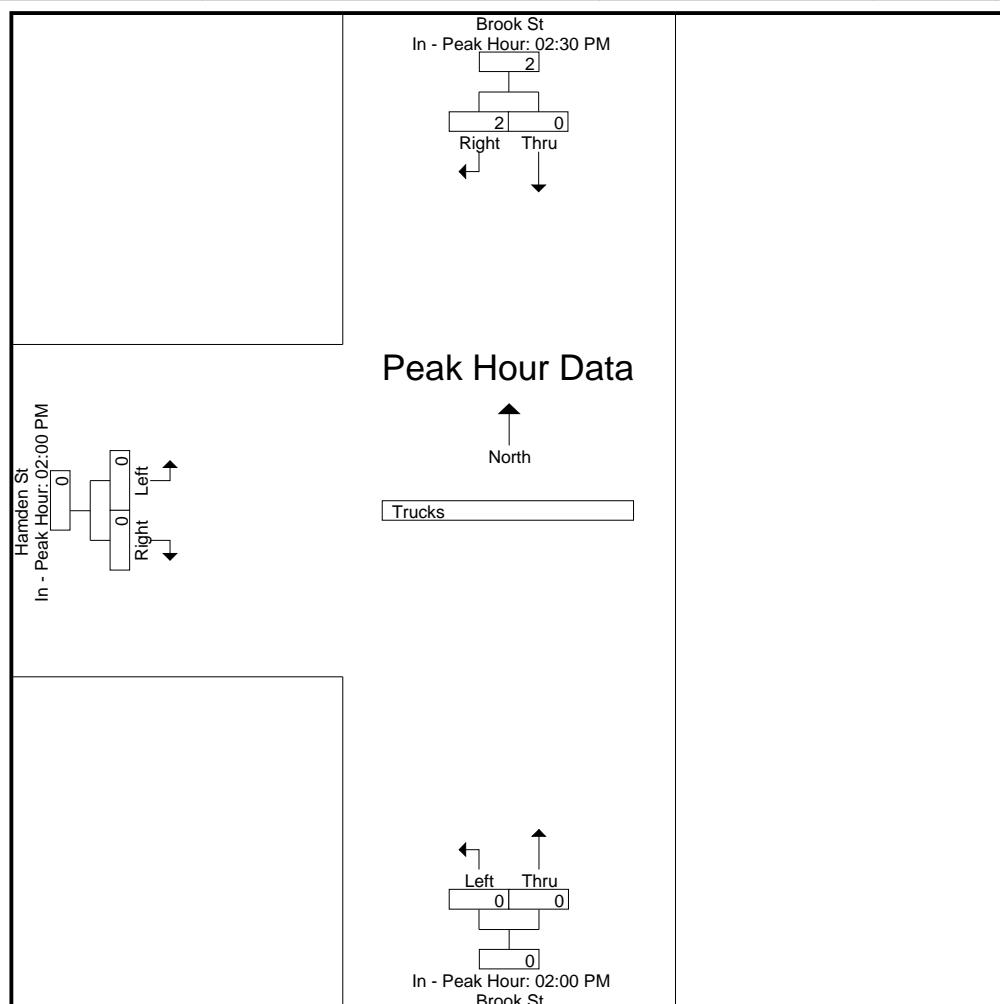
N/S Street : Brook Street  
E/W Street: Hamden Street  
City/State : Wellesley, MA  
Weather : Rain

File Name : 547J0007  
Site Code : 547J0007  
Start Date : 9/25/2018  
Page No : 9

	Brook St From North			Brook St From South			Hamden St From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:



**Accurate Counts**  
978-664-2565

N/S Street : Brook Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0007  
 Site Code : 547J0007  
 Start Date : 9/25/2018  
 Page No : 10

**Groups Printed- Bikes Peds**

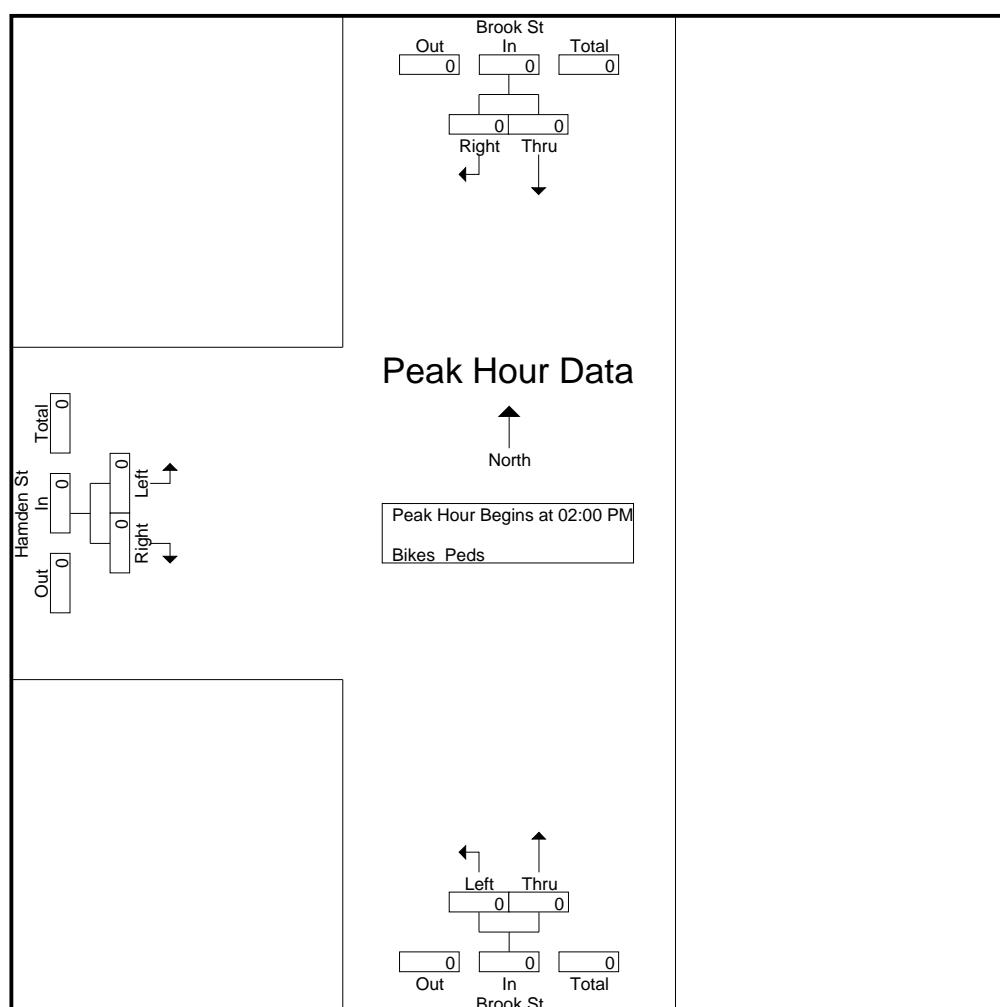
	Brook St From North			Brook St From South			Hamden St From West						
	Start Time	Thru	Right	Peds	Left	Thru	Peds	Left	Right	Peds	Excl. Total	Incl. Total	Int. Total
02:00 PM		0	0	0	0	0	0	0	0	1	1	0	1
02:15 PM		0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM		0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM		0	0	0	0	0	0	0	0	0	0	0	0
Total		0	0	0	0	0	0	0	0	1	1	0	1
03:00 PM		0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM		0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM		0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM		0	0	0	0	0	0	0	0	0	0	0	0
Total		0	0	0	0	0	0	0	0	0	0	0	0
Grand Total		0	0	0	0	0	0	0	0	1	1	0	1
Apprch %		0	0		0	0		0	0				
Total %											100	0	

**Accurate Counts**  
978-664-2565

N/S Street : Brook Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Rain

File Name : 547J0007  
 Site Code : 547J0007  
 Start Date : 9/25/2018  
 Page No : 11

	Brook St From North			Brook St From South			Hamden St From West			Int. Total
	Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:00 PM										
02:00 PM	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000



**Accurate Counts**  
978-664-2565

N/S Street : Brook Street  
 E/W Street: Hamden Street  
 City/State : Wellesley, MA  
 Weather : Rain

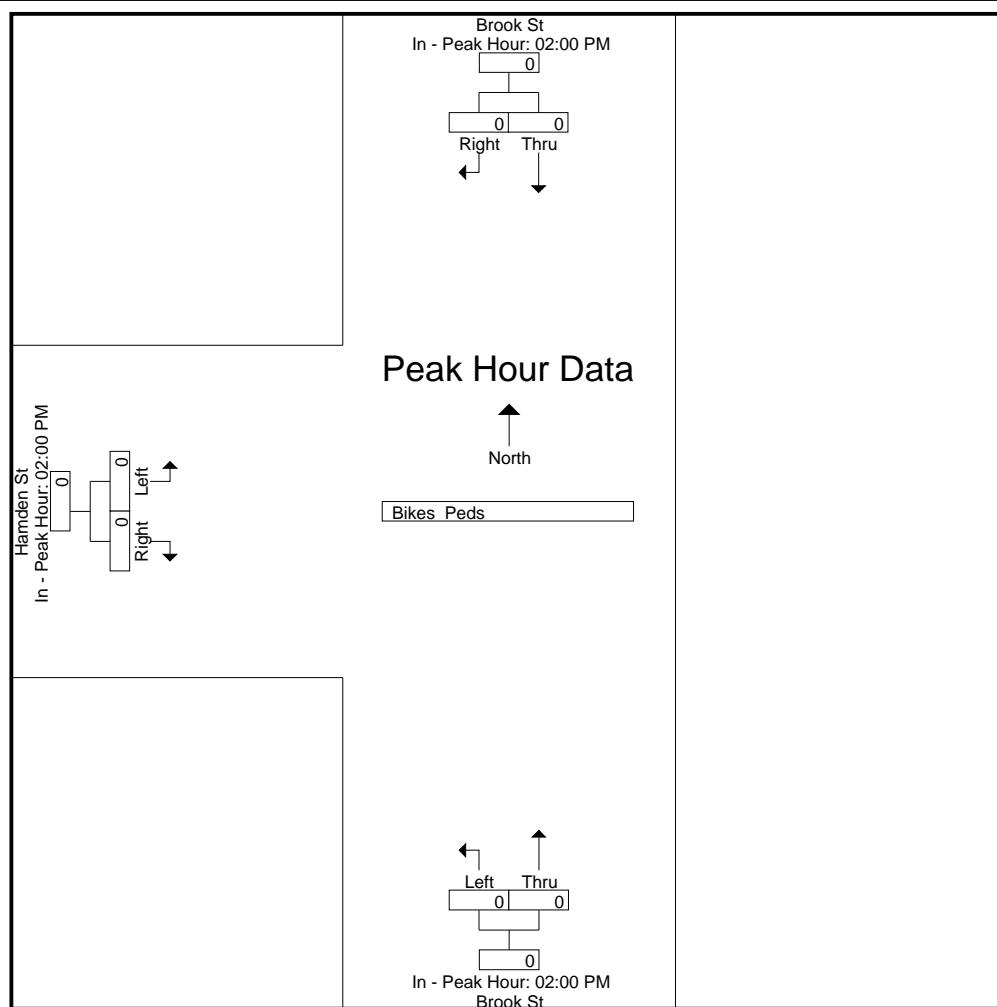
File Name : 547J0007  
 Site Code : 547J0007  
 Start Date : 9/25/2018  
 Page No : 12

	Brook St From North			Brook St From South			Hamden St From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	02:00 PM	02:00 PM	02:00 PM
+0 mins.	0 0 0	0 0 0	0 0 0
+15 mins.	0 0 0	0 0 0	0 0 0
+30 mins.	0 0 0	0 0 0	0 0 0
+45 mins.	0 0 0	0 0 0	0 0 0
Total Volume	0 0 0	0 0 0	0 0 0
% App. Total	0 0	0 0	0 0
PHF	.000 .000 .000	.000 .000 .000	.000 .000 .000



Client: Tyler de Ruiter  
 Project #: 0012\_BETA\_Wellesley  
 BTD #: Location 11A  
 Location: Wellesley, MA  
 Street 1: Washington Street  
 Street 2: Wellesley Avenue/Town Hall  
 Count Date: 12/15/2016  
 Day of Week: Thursday  
 Weather: Cloudy, 20° F

# BOSTON

## TRAFFIC DATA

PO BOX 1723, Framingham, MA 01701  
 Office: 978-746-1259  
 DataRequest@BostonTrafficData.com  
 www.BostonTrafficData.com

TOTAL (CARS & TRUCKS)																
Washington Street North-Eastbound					Washington Street South-Westbound					Town Hall Driveway Eastbound				Wellesley Avenue Westbound		
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	114	84	0	10	40	2	0	0	0	0	0	47	0	6
7:15 AM	0	0	123	104	0	15	54	3	0	0	0	0	0	67	0	9
7:30 AM	0	0	121	114	0	19	63	2	0	0	0	0	0	81	1	12
7:45 AM	0	0	128	128	0	17	67	1	0	0	0	0	0	89	0	13
8:00 AM	0	1	123	129	0	14	64	4	0	0	0	0	0	88	2	10
8:15 AM	0	0	118	124	0	22	70	3	0	0	0	0	0	105	1	12
8:30 AM	1	0	102	108	0	28	69	5	0	0	0	0	0	112	3	13
8:45 AM	0	1	95	101	0	26	72	3	0	0	0	0	0	108	0	11

Washington Street North-Eastbound					Washington Street South-Westbound					Town Hall Driveway Eastbound				Wellesley Avenue Westbound		
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
2:00 PM	0	3	91	98	0	11	71	7	0	0	0	0	0	70	2	10
2:15 PM	0	2	108	123	0	19	82	5	0	0	0	0	0	87	0	14
2:30 PM	0	1	103	136	0	26	85	6	0	0	0	0	0	95	1	12
2:45 PM	0	2	106	149	0	29	92	5	0	0	0	0	0	102	0	15
3:00 PM	0	4	98	148	0	28	90	7	0	0	0	0	0	99	2	13
3:15 PM	0	1	105	146	0	34	101	8	0	0	0	0	0	102	1	12
3:30 PM	0	2	102	131	0	37	103	6	0	0	0	0	0	96	4	10
3:45 PM	0	0	107	127	0	33	108	4	0	0	0	0	0	101	2	11

AM PEAK HOUR 7:45 AM to 8:45 AM	Washington Street North-Eastbound					Washington Street South-Westbound					Town Hall Driveway Eastbound				Wellesley Avenue Westbound		
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
	1	1	471	489	0	81	270	13	0	0	0	0	0	394	6	48	
PHF	0.94				0.89				0.00				0.88				
HV %	0.0%	0.0%	2.1%	2.5%	0.0%	1.2%	4.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.3%	0.0%	0.0%	

PM PEAK HOUR 2:45 PM to 3:45 PM	Washington Street North-Eastbound					Washington Street South-Westbound					Town Hall Driveway Eastbound				Wellesley Avenue Westbound		
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
	0	9	411	574	0	128	386	26	0	0	0	0	0	399	7	50	
PHF	0.97				0.92				0.00				0.97				
HV %	0.0%	0.0%	1.0%	2.4%	0.0%	1.6%	2.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.0%	0.0%	2.0%	

Client: Tyler de Ruiter  
 Project #: 0012\_BETA\_Wellesley  
 BTD #: Location 11A  
 Location: Wellesley, MA  
 Street 1: Washington Street  
 Street 2: Wellesley Avenue/Town Hall  
 Count Date: 12/15/2016  
 Day of Week: Thursday  
 Weather: Cloudy, 20° F

# BOSTON

## TRAFFIC DATA

PO BOX 1723, Framingham, MA 01701  
 Office: 978-746-1259  
 DataRequest@BostonTrafficData.com  
 www.BostonTrafficData.com

### TRUCKS

Start Time	Washington Street North-Eastbound				Washington Street South-Westbound				Town Hall Driveway Eastbound				Wellesley Avenue Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	5	1	0	2	3	0	0	0	0	0	0	2	0	0
7:15 AM	0	0	4	3	0	0	2	0	0	0	0	0	0	2	0	0
7:30 AM	0	0	3	4	0	1	3	0	0	0	0	0	0	1	0	0
7:45 AM	0	0	1	3	0	1	4	0	0	0	0	0	0	3	0	0
8:00 AM	0	0	2	2	0	0	2	0	0	0	0	0	0	2	0	0
8:15 AM	0	0	4	4	0	0	3	0	0	0	0	0	0	5	0	0
8:30 AM	0	0	3	3	0	0	4	0	0	0	0	0	0	7	0	0
8:45 AM	0	0	2	2	0	0	3	0	0	0	0	0	0	4	0	0

Start Time	Washington Street North-Eastbound				Washington Street South-Westbound				Town Hall Driveway Eastbound				Wellesley Avenue Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
2:00 PM	0	0	3	2	0	0	2	0	0	0	0	0	0	4	0	1
2:15 PM	0	0	2	3	0	0	3	0	0	0	0	0	0	2	0	0
2:30 PM	0	0	1	4	0	0	4	0	0	0	0	0	0	3	0	1
2:45 PM	0	0	0	3	0	1	3	0	0	0	0	0	0	4	0	0
3:00 PM	0	0	1	2	0	1	1	0	0	0	0	0	0	2	0	1
3:15 PM	0	0	2	4	0	0	3	0	0	0	0	0	0	3	0	0
3:30 PM	0	0	1	5	0	0	2	0	0	0	0	0	0	3	0	0
3:45 PM	0	0	0	3	0	0	1	0	0	0	0	0	0	1	0	0

AM PEAK HOUR 7:45 AM to 8:45 AM PHF	Washington Street North-Eastbound				Washington Street South-Westbound				Town Hall Driveway Eastbound				Wellesley Avenue Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	0	10	12	0	1	13	0	0	0	0	0	0	17	0	0
	<b>0.69</b>				<b>0.70</b>				<b>0.00</b>				<b>0.61</b>			

PM PEAK HOUR 2:00 PM to 3:00 PM PHF	Washington Street North-Eastbound				Washington Street South-Westbound				Town Hall Driveway Eastbound				Wellesley Avenue Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	0	6	12	0	1	12	0	0	0	0	0	0	13	0	2
	<b>0.90</b>				<b>0.81</b>				<b>0.00</b>				<b>0.75</b>			

Client: Tyler de Ruiter  
 Project #: 0012\_BETA\_Wellesley  
 BTD #: Location 11A  
 Location: Wellesley, MA  
 Street 1: Washington Street  
 Wellesley Avenue/Town Hall  
 Street 2: Driveway  
 Count Date: 12/15/2016  
 Day of Week: Thursday  
 Weather: Cloudy, 20° F

**BOSTON**  
**TRAFFIC DATA**  
 PO BOX 1723, Framingham, MA 01701  
 Office: 978-746-1259  
 DataRequest@BostonTrafficData.com  
 www.BostonTrafficData.com

PEDESTRIANS & BICYCLES																
Washington Street North-Eastbound				Washington Street South-Westbound				Town Hall Driveway Eastbound				Wellesley Avenue Westbound				
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PEDESTRIANS & BICYCLES																
Washington Street North-Eastbound				Washington Street South-Westbound				Town Hall Driveway Eastbound				Wellesley Avenue Westbound				
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
2:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	5	0	0	0	2	0	0	0	2	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	2	0	0	0	0	0	0	0	2	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PEDESTRIANS & BICYCLES																
Washington Street North-Eastbound				Washington Street South-Westbound				Town Hall Driveway Eastbound				Wellesley Avenue Westbound				
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PEDESTRIANS & BICYCLES																
Washington Street North-Eastbound				Washington Street South-Westbound				Town Hall Driveway Eastbound				Wellesley Avenue Westbound				
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
2:45 PM	0	0	0	2	0	0	0	0	0	0	0	2	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

<sup>1</sup>Peak hours corresponds to vehicular peak hours.

Client: Tyler de Ruiter  
 Project #: 0012\_BETA\_Wellesley  
 BTD #: Location 11B  
 Location: Wellesley, MA  
 Street 1: Wellesley Avenue  
 Street 2: Brook Street  
 Count Date: 12/15/2016  
 Day of Week: Thursday  
 Weather: Cloudy, 20° F

# BOSTON

## TRAFFIC DATA

PO BOX 1723, Framingham, MA 01701  
 Office: 978-746-1259  
 DataRequest@BostonTrafficData.com  
 www.BostonTrafficData.com

### TOTAL (CARS & TRUCKS)

Start Time	U-Turn	Brook Street Northbound				Southbound				Wellesley Avenue Eastbound				Wellesley Avenue Westbound			
		Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
7:00 AM	0	7	0	1	0	0	0	0	0	0	89	5	0	0	46	0	
7:15 AM	0	13	0	3	0	0	0	0	0	0	106	13	0	0	63	0	
7:30 AM	0	17	0	4	0	0	0	0	0	0	114	19	0	0	77	0	
7:45 AM	0	20	0	6	0	0	0	0	0	0	128	17	0	1	82	0	
8:00 AM	0	19	0	7	0	0	0	0	0	0	129	14	0	0	81	0	
8:15 AM	0	16	0	5	0	0	0	0	0	0	117	29	0	0	102	0	
8:30 AM	0	11	0	2	0	0	0	0	0	0	94	42	0	0	117	0	
8:45 AM	0	12	0	3	0	0	0	0	0	0	89	38	0	1	107	0	

Start Time	U-Turn	Brook Street Northbound				Southbound				Wellesley Avenue Eastbound				Wellesley Avenue Westbound			
		Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
2:00 PM	0	6	0	6	0	0	0	0	0	0	100	9	0	0	76	0	
2:15 PM	0	8	0	5	0	0	0	0	0	0	128	14	0	0	93	0	
2:30 PM	0	10	0	3	0	0	0	0	0	0	144	18	0	2	98	0	
2:45 PM	0	9	0	4	0	0	0	0	0	0	154	24	0	0	108	0	
3:00 PM	0	11	0	2	0	0	0	0	0	0	149	27	0	0	103	0	
3:15 PM	0	13	0	3	0	0	0	0	0	0	151	29	0	1	102	0	
3:30 PM	0	12	0	4	0	0	0	0	0	0	140	28	0	0	98	0	
3:45 PM	0	10	0	3	0	0	0	0	0	0	131	29	0	0	104	0	

AM PEAK HOUR 7:45 AM to 8:45 AM	Brook Street Northbound				Southbound				Wellesley Avenue Eastbound				Wellesley Avenue Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	66	0	20	0	0	0	0	0	0	468	102	0	1	382	0
PHF HV %		0.83		0.00						0.98				0.82		
	0.0%	1.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.6%	1.0%	0.0%	0.0%	4.2%	0.0%

PM PEAK HOUR 2:45 PM to 3:45 PM	Brook Street Northbound				Southbound				Wellesley Avenue Eastbound				Wellesley Avenue Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	45	0	13	0	0	0	0	0	0	594	108	0	1	411	0
PHF HV %		0.91		0.00						0.98				0.95		
	0.0%	2.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.4%	1.9%	0.0%	0.0%	0.7%	0.0%

Client: Tyler de Ruiter  
 Project #: 0012\_BETA\_Wellesley  
 BTD #: Location 11B  
 Location: Wellesley, MA  
 Street 1: Wellesley Avenue  
 Street 2: Brook Street  
 Count Date: 12/15/2016  
 Day of Week: Thursday  
 Weather: Cloudy, 20° F

# BOSTON

## TRAFFIC DATA

PO BOX 1723, Framingham, MA 01701  
 Office: 978-746-1259  
 DataRequest@BostonTrafficData.com  
 www.BostonTrafficData.com

### TRUCKS

Start Time	U-Turn	Brook Street Northbound				Southbound				Wellesley Avenue Eastbound				Wellesley Avenue Westbound			
		Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
7:00 AM	0	0	0	0	0	0	0	0	0	0	2	1	0	0	2	0	
7:15 AM	0	1	0	0	0	0	0	0	0	0	3	0	0	0	1	0	
7:30 AM	0	0	0	0	0	0	0	0	0	0	5	0	0	0	1	0	
7:45 AM	0	0	0	0	0	0	0	0	0	0	3	1	0	0	3	0	
8:00 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	
8:15 AM	0	1	0	0	0	0	0	0	0	0	4	0	0	0	4	0	
8:30 AM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	7	0	
8:45 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	4	0	

Start Time	U-Turn	Brook Street Northbound				Southbound				Wellesley Avenue Eastbound				Wellesley Avenue Westbound			
		Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
2:00 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	1	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	2	0	0
3:00 PM	0	1	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	4	1	0	0	1	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0

AM PEAK HOUR 7:45 AM to 8:45 AM PHF	Brook Street Northbound				Southbound				Wellesley Avenue Eastbound				Wellesley Avenue Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	1	0	0	0	0	0	0	0	0	12	1	0	0	16	0
	<b>0.25</b>				<b>0.00</b>				<b>0.81</b>				<b>0.57</b>			

PM PEAK HOUR 2:45 PM to 3:45 PM PHF	Brook Street Northbound				Southbound				Wellesley Avenue Eastbound				Wellesley Avenue Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	1	0	0	0	0	0	0	0	0	14	2	0	0	3	0
	<b>0.25</b>				<b>0.00</b>				<b>0.80</b>				<b>0.38</b>			

Client: Tyler de Ruiter  
 Project #: 0012\_BETA\_Wellesley  
 BTD #: Location 11B  
 Location: Wellesley, MA  
 Street 1: Wellesley Avenue  
 Street 2: Brook Street  
 Count Date: 12/15/2016  
 Day of Week: Thursday  
 Weather: Cloudy, 20° F



#### PEDESTRIANS & BICYCLES

Brook Street Northbound					Southbound					Wellesley Avenue Eastbound					Wellesley Avenue Westbound				
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED			
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:00 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Brook Street Northbound					Southbound					Wellesley Avenue Eastbound					Wellesley Avenue Westbound				
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED			
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3:00 PM	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Brook Street Northbound					Southbound					Wellesley Avenue Eastbound					Wellesley Avenue Westbound				
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED			
7:45 AM to 8:45 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	

Brook Street Northbound					Southbound					Wellesley Avenue Eastbound					Wellesley Avenue Westbound				
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED			
2:45 PM to 3:45 PM	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

<sup>1</sup>Peak hours corresponds to vehicular peak hours.

## APPENDIX B

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- Analysis Worksheets
  - 2018 Existing AM
  - 2018 Existing PM
  - 2023 No-Build AM
  - 2023 No-Build PM
  - 2023 Build AM
  - 2023 Build PM
  - 2026 No-Build AM
  - 2026 No-Build PM
  - 2026 Build AM
  - 2026 Build PM

HCM Unsigneded Intersection Capacity Analysis  
210: Library Lot & Washington St

Synchro 9 Report  
10/18/2018



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1277	11	11	685	0	0
Future Volume (Veh/h)	1277	11	11	685	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.83	0.90	0.90	0.54	0.54
Hourly flow rate (vph)	1539	13	12	761	0	0
Pedestrians	1				9	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	0				1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	186			520		
pX, platoon unblocked			0.71		0.71	0.71
vC, conflicting volume			1561		1960	785
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			959		1525	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	100
cm capacity (veh/h)			508		76	764
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	1026	526	266	507	0	
Volume Left	0	0	12	0	0	
Volume Right	0	13	0	0	0	
cSH	1700	1700	508	1700	1700	
Volume to Capacity	0.60	0.31	0.02	0.30	0.00	
Queue Length 95th (ft)	0	0	2	0	0	
Control Delay (s)	0.0	0.0	0.9	0.0	0.0	
Lane LOS			A		A	
Approach Delay (s)	0.0		0.3		0.0	
Approach LOS			A			
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			39.0%		ICU Level of Service	
Analysis Period (min)			15		A	

Intersection

Int Delay, s/veh 0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
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Lane Configurations						
Traffic Vol, veh/h	1277	11	11	685	0	0
Future Vol, veh/h	1277	11	11	685	0	0
Conflicting Peds, #/hr	0	9	9	0	1	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	83	83	90	90	54	54
Heavy Vehicles, %	1	0	0	1	0	0
Mvmt Flow	1539	13	12	761	0	0

Major/Minor	Major1	Major2	Minor1
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Conflicting Flow All	0	0	1561	0	-	785
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	4.1	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.2	-	-	3.3
Pot Cap-1 Maneuver	-	-	429	-	0	340
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	429	-	-	337
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
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HCM Control Delay, s	0	0.5	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	429	-
HCM Lane V/C Ratio	-	-	-	0.028	-
HCM Control Delay (s)	0	-	-	13.6	0.3
HCM Lane LOS	A	-	-	B	A
HCM 95th %tile Q(veh)	-	-	-	0.1	-

HCM Unsignalized Intersection Capacity Analysis  
220: Grove St & Spring St

Synchro 9 Report  
10/18/2018



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (veh/h)	43	48	160	33	14	81
Future Volume (Veh/h)	43	48	160	33	14	81
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.57	0.57	0.77	0.77	0.67	0.67
Hourly flow rate (vph)	75	84	208	43	21	121
Pedestrians	16		4		13	
Lane Width (ft)	12.0		12.0		12.0	
Walking Speed (ft/s)	4.0		4.0		4.0	
Percent Blockage	1		0		1	
Right turn flare (veh)						
Median type		None			None	
Median storage veh						
Upstream signal (ft)					285	
pX, platoon unblocked						
vC, conflicting volume	412	258		267		
vc1, stage 1 conf vol						
vc2, stage 2 conf vol						
vCu, unblocked vol	412	258		267		
tC, single (s)	6.4	6.2		4.1		
tC, 2 stage (s)						
tF (s)	3.5	3.3		2.2		
p0 queue free %	87	89		98		
cm capacity (veh/h)	576	757		1291		
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	159	251	142			
Volume Left	75	0	21			
Volume Right	84	43	0			
cSH	659	1700	1291			
Volume to Capacity	0.24	0.15	0.02			
Queue Length 95th (ft)	23	0	1			
Control Delay (s)	12.2	0.0	1.3			
Lane LOS	B		A			
Approach Delay (s)	12.2	0.0	1.3			
Approach LOS	B					
Intersection Summary						
Average Delay		3.8				
Intersection Capacity Utilization		31.4%		ICU Level of Service		A
Analysis Period (min)		15				

Intersection

Int Delay, s/veh 3.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
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Lane Configurations						
Traffic Vol, veh/h	43	48	160	33	14	81
Future Vol, veh/h	43	48	160	33	14	81
Conflicting Peds, #/hr	4	13	0	16	16	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	57	57	77	77	67	67
Heavy Vehicles, %	2	4	2	0	0	17
Mvmt Flow	75	84	208	43	21	121

Major/Minor	Minor1	Major1	Major2
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Conflicting Flow All	412	258	0	0	267	0
Stage 1	245	-	-	-	-	-
Stage 2	167	-	-	-	-	-
Critical Hdwy	6.42	6.24	-	-	4.1	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.336	-	-	2.2	-
Pot Cap-1 Maneuver	596	776	-	-	1308	-
Stage 1	796	-	-	-	-	-
Stage 2	863	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	576	757	-	-	1294	-
Mov Cap-2 Maneuver	576	-	-	-	-	-
Stage 1	785	-	-	-	-	-
Stage 2	846	-	-	-	-	-

Approach	WB	NB	SB
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HCM Control Delay, s	12.2	0	1.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
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Capacity (veh/h)	-	-	659	1294	-
HCM Lane V/C Ratio	-	-	0.242	0.016	-
HCM Control Delay (s)	-	-	12.2	7.8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.9	0	-

HCM Unsignalized Intersection Capacity Analysis  
230: Grove St & Hampden St

Synchro 9 Report  
10/18/2018



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (veh/h)	68	33	150	299	41	69
Future Volume (Veh/h)	68	33	150	299	41	69
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.72	0.72	0.85	0.85	0.92	0.92
Hourly flow rate (vph)	94	46	176	352	45	75
Pedestrians	7					12
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	1					1
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	524	371		535		
vc1, stage 1 conf vol						
vc2, stage 2 conf vol						
vCu, unblocked vol	524	371		535		
tC, single (s)	6.4	6.2		4.1		
tC, 2 stage (s)						
tF (s)	3.5	3.3		2.2		
p0 queue free %	81	93		96		
cm capacity (veh/h)	491	669		1012		
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	140	528	120			
Volume Left	94	0	45			
Volume Right	46	352	0			
cSH	538	1700	1012			
Volume to Capacity	0.26	0.31	0.04			
Queue Length 95th (ft)	26	0	3			
Control Delay (s)	14.0	0.0	3.5			
Lane LOS	B		A			
Approach Delay (s)	14.0	0.0	3.5			
Approach LOS	B					
Intersection Summary						
Average Delay		3.0				
Intersection Capacity Utilization		51.2%		ICU Level of Service		A
Analysis Period (min)		15				

Intersection

Int Delay, s/veh 3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	B		A		
Traffic Vol, veh/h	68	33	150	299	41	69
Future Vol, veh/h	68	33	150	299	41	69
Conflicting Peds, #/hr	0	12	0	7	7	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	72	72	85	85	92	92
Heavy Vehicles, %	0	0	2	1	5	6
Mvmt Flow	94	46	176	352	45	75

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	523	371	0	0	535
Stage 1	359	-	-	-	-
Stage 2	164	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.15
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.245
Pot Cap-1 Maneuver	518	679	-	-	1018
Stage 1	711	-	-	-	-
Stage 2	870	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	491	668	-	-	1008
Mov Cap-2 Maneuver	491	-	-	-	-
Stage 1	707	-	-	-	-
Stage 2	829	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14	0	3.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	538	1008	-
HCM Lane V/C Ratio	-	-	0.261	0.044	-
HCM Control Delay (s)	-	-	14	8.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1	0.1	-

HCM Unsignalized Intersection Capacity Analysis  
240: Hampden St & Cameron St

Synchro 9 Report  
10/18/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	100	188	161	78	4	12
Future Volume (Veh/h)	100	188	161	78	4	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.62	0.62	0.68	0.68	0.40	0.40
Hourly flow rate (vph)	161	303	237	115	10	30
Pedestrians		1	16		3	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	355			938	298	
vc1, stage 1 conf vol						
vc2, stage 2 conf vol						
vCu, unblocked vol	355			938	298	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	87			96	96	
cM capacity (veh/h)	1195			252	743	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	464	352	40			
Volume Left	161	0	10			
Volume Right	0	115	30			
cSH	1195	1700	500			
Volume to Capacity	0.13	0.21	0.08			
Queue Length 95th (ft)	12	0	6			
Control Delay (s)	3.9	0.0	12.8			
Lane LOS	A		B			
Approach Delay (s)	3.9	0.0	12.8			
Approach LOS			B			
Intersection Summary						
Average Delay		2.7				
Intersection Capacity Utilization		42.4%		ICU Level of Service		A
Analysis Period (min)		15				

**Intersection**

Int Delay, s/veh 2.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	100	188	161	78	4	12
Future Vol, veh/h	100	188	161	78	4	12
Conflicting Peds, #/hr	3	0	0	3	16	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	62	62	68	68	40	40
Heavy Vehicles, %	3	1	1	1	0	0
Mvmt Flow	161	303	237	115	10	30

Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	354	0	-	0	939	298
Stage 1	-	-	-	-	297	-
Stage 2	-	-	-	-	642	-
Critical Hdwy	4.13	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.227	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1199	-	-	-	295	746
Stage 1	-	-	-	-	758	-
Stage 2	-	-	-	-	528	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1198	-	-	-	246	744
Mov Cap-2 Maneuver	-	-	-	-	246	-
Stage 1	-	-	-	-	756	-
Stage 2	-	-	-	-	441	-

Approach	EB	WB	SB			
HCM Control Delay, s	2.9	0	12.9			
HCM LOS			B			

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1198	-	-	-	494	
HCM Lane V/C Ratio	0.135	-	-	-	0.081	
HCM Control Delay (s)	8.5	0	-	-	12.9	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0.5	-	-	-	0.3	

HCM Unsignalized Intersection Capacity Analysis  
250: Brook St & Hampden St

Synchro 9 Report  
10/18/2018

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	80	111	160	46	43	72
Future Volume (Veh/h)	80	111	160	46	43	72
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.78	0.78	0.67	0.67
Hourly flow rate (vph)	98	135	205	59	64	107
Pedestrians	9					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	1					
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (ft)				1034		
pX, platoon unblocked						
vC, conflicting volume	596	126	180			
vc1, stage 1 conf vol						
vc2, stage 2 conf vol						
vCu, unblocked vol	596	126	180			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	75	85	85			
cm capacity (veh/h)	398	922	1391			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	233	264	171			
Volume Left	98	205	0			
Volume Right	135	0	107			
cSH	593	1391	1700			
Volume to Capacity	0.39	0.15	0.10			
Queue Length 95th (ft)	47	13	0			
Control Delay (s)	14.9	6.5	0.0			
Lane LOS	B	A				
Approach Delay (s)	14.9	6.5	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay		7.8				
Intersection Capacity Utilization		35.9%		ICU Level of Service		A
Analysis Period (min)		15				

Intersection

Int Delay, s/veh 7.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W		A	B		
Traffic Vol, veh/h	80	111	160	46	43	72
Future Vol, veh/h	80	111	160	46	43	72
Conflicting Peds, #/hr	0	0	9	0	0	9
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	78	78	67	67
Heavy Vehicles, %	0	0	1	0	2	1
Mvmt Flow	98	135	205	59	64	107

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	596	127	181	0	-
Stage 1	127	-	-	-	-
Stage 2	469	-	-	-	-
Critical Hdwy	6.4	6.2	4.11	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.209	-	-
Pot Cap-1 Maneuver	470	929	1400	-	-
Stage 1	904	-	-	-	-
Stage 2	634	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	393	922	1400	-	-
Mov Cap-2 Maneuver	393	-	-	-	-
Stage 1	897	-	-	-	-
Stage 2	534	-	-	-	-

Approach	EB	NB	SB	
HCM Control Delay, s	15	6.2	0	
HCM LOS	C			

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1400	-	590	-	-
HCM Lane V/C Ratio	0.147	-	0.395	-	-
HCM Control Delay (s)	8	0	15	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.5	-	1.9	-	-

## Queues

Synchro 9 Report

10: Washington St &amp; Grove St &amp; Central St

10/18/2018



Lane Group	EBT	WBL2	WBL	WBT	NBL2	NBL	NBT	SBL	SBT	NER	Ø9
Lane Configurations											
Traffic Volume (vph)	694	8	179	437	6	132	20	38	22	456	
Future Volume (vph)	694	8	179	437	6	132	20	38	22	456	
Lane Group Flow (vph)	880	0	204	512	0	0	245	0	88	519	
Turn Type	NA	custom	Prot	NA	Perm	Perm	NA	Perm	NA	Over	
Protected Phases	2		1	6			8		4	1	9
Permitted Phases			1		8	8		4			
Detector Phase	2	1	1	6	8	8	8	4	4	1	
Switch Phase											
Minimum Initial (s)	7.0	7.0	7.0	7.0	6.0	6.0	6.0	6.0	6.0	7.0	1.0
Minimum Split (s)	12.0	12.0	12.0	12.0	11.0	11.0	11.0	11.0	11.0	12.0	32.0
Total Split (s)	42.0	36.0	36.0	78.0	30.0	30.0	30.0	30.0	30.0	36.0	32.0
Total Split (%)	30.0%	25.7%	25.7%	55.7%	21.4%	21.4%	21.4%	21.4%	21.4%	25.7%	23%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lost Time Adjust (s)	0.0		0.0			0.0		0.0		0.0	
Total Lost Time (s)	5.0		5.0			5.0		5.0		5.0	
Lead/Lag	Lag	Lead	Lead							Lead	
Lead-Lag Optimize?	Yes	Yes	Yes							Yes	
Recall Mode	Min	None	None	Min	None	None	None	None	None	None	None
v/c Ratio	0.89		3.85	0.50			0.98		0.34	0.72	
Control Delay	53.0		1326.2	14.6			99.5		49.0	42.4	
Queue Delay	0.0		0.0	0.6			0.0		0.0	1.3	
Total Delay	53.0		1326.2	15.2			99.5		49.0	43.7	
Queue Length 50th (ft)	288		~256	131			165		51	150	
Queue Length 95th (ft)	#558		#510	428			#403		105	#290	
Internal Link Dist (ft)	525			238			205		238		
Turn Bay Length (ft)										100	
Base Capacity (vph)	989		53	1018			251		261	716	
Starvation Cap Reductn	0		0	214			0		0	0	
Spillback Cap Reductn	0		0	0			0		0	70	
Storage Cap Reductn	0		0	0			0		0	0	
Reduced v/c Ratio	0.89		3.85	0.64			0.98		0.34	0.80	

## Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 120.8

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

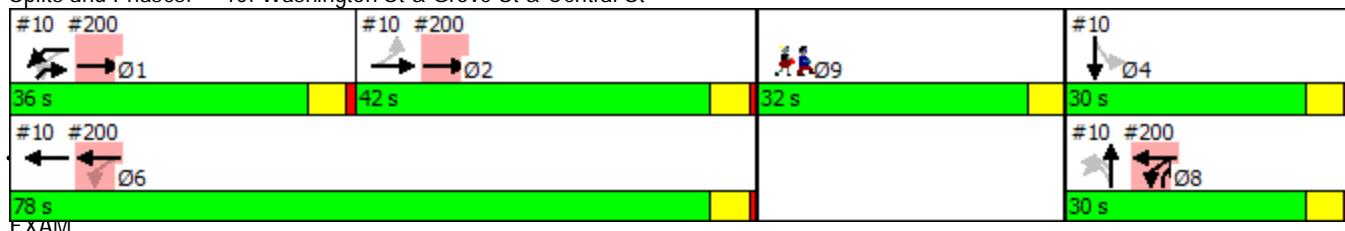
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 10: Washington St &amp; Grove St &amp; Central St



## HCM Signalized Intersection Capacity Analysis

Synchro 9 Report

10: Washington St &amp; Grove St &amp; Central St

10/18/2018



Movement	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	694	64	7	8	179	437	34	6	132	20	50	38
Future Volume (vph)	694	64	7	8	179	437	34	6	132	20	50	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	-4%					0%				0%		
Total Lost time (s)	5.0				5.0	5.0				5.0		
Lane Util. Factor	0.95				1.00	1.00				1.00		
Frpb, ped/bikes	1.00				1.00	1.00				0.99		
Fpb, ped/bikes	1.00				1.00	1.00				0.99		
Fr	0.99				1.00	0.99				0.97		
Flt Protected	1.00				0.95	1.00				0.97		
Satd. Flow (prot)	3179				1539	1657				1544		
Flt Permitted	1.00				0.13	1.00				0.75		
Satd. Flow (perm)	3179				206	1657				1201		
Peak-hour factor, PHF	0.87	0.87	0.87	0.92	0.92	0.92	0.92	0.85	0.85	0.85	0.85	0.75
Adj. Flow (vph)	798	74	8	9	195	475	37	7	155	24	59	51
RTOR Reduction (vph)	1	0	0	0	0	2	0	0	0	0	0	0
Lane Group Flow (vph)	879	0	0	0	204	510	0	0	0	245	0	0
Confl. Peds. (#/hr)	5	5	5	5			16		16		11	11
Confl. Bikes (#/hr)	5	5				2						
Heavy Vehicles (%)	2%	6%	0%	33%	4%	2%	0%	0%	2%	0%	2%	3%
Turn Type	NA		custom		Prot	NA		Perm	Perm	NA		Perm
Protected Phases	2				1	6				8		
Permitted Phases			1					8	8			4
Actuated Green, G (s)	37.7				31.5	74.2				25.4		
Effective Green, g (s)	37.7				31.5	74.2				25.4		
Actuated g/C Ratio	0.31				0.26	0.60				0.21		
Clearance Time (s)	5.0				5.0	5.0				5.0		
Vehicle Extension (s)	3.0				3.0	3.0				3.0		
Lane Grp Cap (vph)	972				52	997				247		
v/s Ratio Prot	c0.28					0.31						
v/s Ratio Perm					c0.99					c0.20		
v/c Ratio	0.90				3.92	0.51				0.99		
Uniform Delay, d1	41.1				45.9	14.1				48.8		
Progression Factor	1.00				0.95	0.79				1.00		
Incremental Delay, d2	11.6				1358.9	0.4				54.8		
Delay (s)	52.7				1402.5	11.6				103.6		
Level of Service	D				F	B				F		
Approach Delay (s)	52.7					407.9				103.6		
Approach LOS	D					F				F		

## Intersection Summary

HCM 2000 Control Delay	159.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.74		
Actuated Cycle Length (s)	123.3	Sum of lost time (s)	19.0
Intersection Capacity Utilization	104.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
10: Washington St & Grove St & Central St

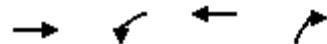
Synchro 9 Report  
10/18/2018



Movement	SBT	SBR	SBR2	NER	NER2
Lane Configurations					
Traffic Volume (vph)	22	5	1	456	1
Future Volume (vph)	22	5	1	456	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Grade (%)	-2%				
Total Lost time (s)	5.0			5.0	
Lane Util. Factor	1.00			0.88	
Frpb, ped/bikes	1.00			1.00	
Fpb, ped/bikes	1.00			1.00	
Fr	0.99			0.85	
Flt Protected	0.97			1.00	
Satd. Flow (prot)	1590			2503	
Flt Permitted	0.76			1.00	
Satd. Flow (perm)	1241			2503	
Peak-hour factor, PHF	0.75	0.75	0.75	0.88	0.88
Adj. Flow (vph)	29	7	1	518	1
RTOR Reduction (vph)	0	0	0	64	0
Lane Group Flow (vph)	88	0	0	455	0
Confl. Peds. (#/hr)		5	16	11	
Confl. Bikes (#/hr)					
Heavy Vehicles (%)	5%	0%	0%	2%	100%
Turn Type	NA			Over	
Protected Phases	4			1	
Permitted Phases					
Actuated Green, G (s)	25.4			31.5	
Effective Green, g (s)	25.4			31.5	
Actuated g/C Ratio	0.21			0.26	
Clearance Time (s)	5.0			5.0	
Vehicle Extension (s)	3.0			3.0	
Lane Grp Cap (vph)	255			639	
v/s Ratio Prot			0.18		
v/s Ratio Perm	0.07				
v/c Ratio	0.35		0.71		
Uniform Delay, d1	41.8		41.8		
Progression Factor	1.00			1.00	
Incremental Delay, d2	0.8		3.7		
Delay (s)	42.7		45.5		
Level of Service	D		D		
Approach Delay (s)	42.7				
Approach LOS	D				
Intersection Summary					

Queues  
200: Cameron St & Washington St

Synchro 9 Report  
10/18/2018



Lane Group	EBT	WBL	WBT	NBR	Ø1	Ø2	Ø4	Ø6	Ø9
Lane Configurations									
Traffic Volume (vph)	1215	27	658	73					
Future Volume (vph)	1215	27	658	73					
Lane Group Flow (vph)	1422	0	737	138					
Turn Type	NA	custom	NA	Over					
Protected Phases	2 1	8	6 8	8	1	2	4	6	9
Permitted Phases			6		8				
Detector Phase	2 1	8	6 8	8					
Switch Phase									
Minimum Initial (s)		6.0		6.0	7.0	7.0	6.0	7.0	1.0
Minimum Split (s)		11.0		11.0	12.0	12.0	11.0	12.0	32.0
Total Split (s)		30.0		30.0	36.0	42.0	30.0	78.0	32.0
Total Split (%)		21.4%		21.4%	26%	30%	21%	56%	23%
Yellow Time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)		1.0		1.0	1.0	1.0	1.0	1.0	0.0
Lost Time Adjust (s)				0.0					
Total Lost Time (s)				5.0					
Lead/Lag					Lead	Lag			
Lead-Lag Optimize?					Yes	Yes			
Recall Mode		None		None	None	Min	None	Min	None
v/c Ratio	0.72		0.31	0.24					
Control Delay	10.1		3.7	1.0					
Queue Delay	1.3		0.0	0.0					
Total Delay	11.4		3.7	1.0					
Queue Length 50th (ft)	74		0	0					
Queue Length 95th (ft)	m210		134	0					
Internal Link Dist (ft)	238		106						
Turn Bay Length (ft)									
Base Capacity (vph)	1969		2395	574					
Starvation Cap Reductn	324		0	0					
Spillback Cap Reductn	0		90	0					
Storage Cap Reductn	0		0	0					
Reduced v/c Ratio	0.86		0.32	0.24					

### Intersection Summary

Cycle Length: 140

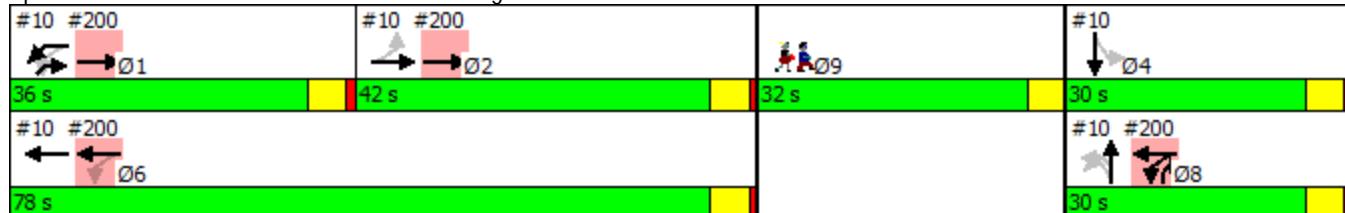
Actuated Cycle Length: 120.8

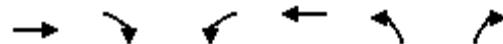
Natural Cycle: 90

Control Type: Actuated-Uncoordinated

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 200: Cameron St & Washington St





Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1215	22	27	658	0	73
Future Volume (vph)	1215	22	27	658	0	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0		5.0
Lane Util. Factor	0.95			0.95		1.00
Frpb, ped/bikes	1.00			1.00		1.00
Flpb, ped/bikes	1.00			1.00		1.00
Fr <sub>t</sub>	1.00			1.00		0.86
Flt Protected	1.00			1.00		1.00
Satd. Flow (prot)	3207			3212		1465
Flt Permitted	1.00			0.87		1.00
Satd. Flow (perm)	3207			2798		1465
Peak-hour factor, PHF	0.87	0.87	0.93	0.93	0.53	0.53
Adj. Flow (vph)	1397	25	29	708	0	138
RTOR Reduction (vph)	1	0	0	0	0	110
Lane Group Flow (vph)	1421	0	0	737	0	28
Confl. Peds. (#/hr)		14	14		18	2
Confl. Bikes (#/hr)			5			1
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Turn Type	NA	custom	NA		Over	
Protected Phases	2 1		8	6 8		8
Permitted Phases			6			8
Actuated Green, G (s)	74.2			99.6		25.4
Effective Green, g (s)	74.2			99.6		25.4
Actuated g/C Ratio	0.60			0.81		0.21
Clearance Time (s)					5.0	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)	1929			2345		301
v/s Ratio Prot	c0.44			c0.06		0.02
v/s Ratio Perm				0.19		
v/c Ratio	0.74			0.31		0.09
Uniform Delay, d1	17.6			3.1		39.6
Progression Factor	0.45			1.00		1.00
Incremental Delay, d2	0.8			0.1		0.1
Delay (s)	8.7			3.1		39.8
Level of Service	A			A		D
Approach Delay (s)	8.7			3.1	39.8	
Approach LOS	A			A	D	
<b>Intersection Summary</b>						
HCM 2000 Control Delay		8.8		HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio		0.60				
Actuated Cycle Length (s)		123.3		Sum of lost time (s)		19.0
Intersection Capacity Utilization		53.7%		ICU Level of Service		A
Analysis Period (min)		15				
c Critical Lane Group						

## Queues

Synchro 9 Report

06/03/2019

11: Wellesley Ave/Town Hall &amp; Washington St



Lane Group	EBT	EBR	WBL	WBT	NBT	Ø4	Ø7	Ø9
Lane Configurations	4	1		4 1	4			
Traffic Volume (vph)	630	658	81	297	0			
Future Volume (vph)	630	658	81	297	0			
Lane Group Flow (vph)	670	700	0	425	531			
Turn Type	NA	pm+ov	Perm	NA	NA			
Protected Phases	2	4 7		6	4 7	4	7	9
Permitted Phases	2	2	6	6				
Detector Phase	2	4 7	6	6	4 7			
Switch Phase								
Minimum Initial (s)	7.0		7.0	7.0		7.0	7.0	5.0
Minimum Split (s)	22.0		22.0	22.0		11.0	11.0	20.0
Total Split (s)	37.0		37.0	37.0		11.0	22.0	20.0
Total Split (%)	41.1%		41.1%	41.1%		12%	24%	22%
Yellow Time (s)	3.0		3.0	3.0		3.0	3.0	2.0
All-Red Time (s)	1.0		1.0	1.0		1.0	1.0	0.0
Lost Time Adjust (s)	0.0			0.0				
Total Lost Time (s)	4.0			4.0				
Lead/Lag					Lag	Lead		
Lead-Lag Optimize?					Yes	Yes		
Recall Mode	Min		Min	Min	None	None	None	
v/c Ratio	0.89	0.51		0.51	0.86			
Control Delay	36.4	1.6		18.6	38.8			
Queue Delay	0.0	0.4		0.0	0.0			
Total Delay	36.4	2.0		18.6	38.8			
Queue Length 50th (ft)	241	0		62	202			
Queue Length 95th (ft)	#643	26		152	#503			
Internal Link Dist (ft)	440			812	7			
Turn Bay Length (ft)								
Base Capacity (vph)	755	1386		838	616			
Starvation Cap Reductn	0	0		0	0			
Spillback Cap Reductn	0	255		0	0			
Storage Cap Reductn	0	0		0	0			
Reduced v/c Ratio	0.89	0.62		0.51	0.86			

## Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 74

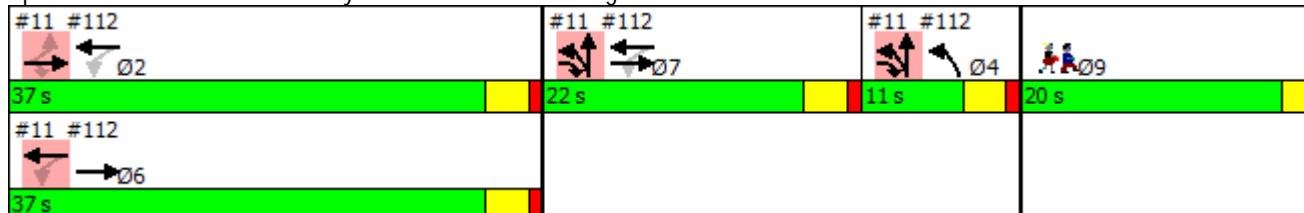
Natural Cycle: 100

Control Type: Actuated-Uncoordinated

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 11: Wellesley Ave/Town Hall &amp; Washington St



HCM Signalized Intersection Capacity Analysis  
11: Wellesley Ave/Town Hall & Washington St

Synchro 9 Report  
06/03/2019



Movement	EBL	EBT	EBC	WBL	WBT	WBC	NBL	NBT	NBC	SBL	SBT	SBC
Lane Configurations												
Traffic Volume (vph)	0	630	658	81	297	0	418	0	49	0	0	0
Future Volume (vph)	0	630	658	81	297	0	418	0	49	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0			4.0				
Lane Util. Factor	1.00	1.00		0.95			1.00					
Frpb, ped/bikes	1.00	1.00		1.00			1.00					
Flpb, ped/bikes	1.00	1.00		1.00			1.00					
Frt	1.00	0.85		1.00			0.99					
Flt Protected	1.00	1.00		0.99			0.96					
Satd. Flow (prot)	1676	1425		3087			1558					
Flt Permitted	1.00	1.00		0.60			0.96					
Satd. Flow (perm)	1676	1425		1863			1558					
Peak-hour factor, PHF	0.94	0.94	0.94	0.89	0.89	0.89	0.88	0.88	0.88	0.92	0.92	0.92
Adj. Flow (vph)	0	670	700	91	334	0	475	0	56	0	0	0
RTOR Reduction (vph)	0	0	120	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	670	580	0	425	0	0	531	0	0	0	0
Confl. Peds. (#/hr)	1				1							
Heavy Vehicles (%)	0%	2%	2%	1%	5%	0%	4%	0%	0%	0%	0%	0%
Turn Type	NA	pm+ov	Perm	NA		Split	NA					
Protected Phases	2	4	7		6		4	7	4	7		
Permitted Phases	2	2	2	6	6							
Actuated Green, G (s)	33.3	62.6		33.3			29.3					
Effective Green, g (s)	33.3	62.6		33.3			29.3					
Actuated g/C Ratio	0.44	0.83		0.44			0.39					
Clearance Time (s)	4.0			4.0								
Vehicle Extension (s)	3.0			3.0								
Lane Grp Cap (vph)	738	1255		820			603					
v/s Ratio Prot	c0.40	0.18					c0.34					
v/s Ratio Perm		0.23		0.23								
v/c Ratio	0.91	0.46		0.52			0.88					
Uniform Delay, d1	19.7	1.8		15.3			21.5					
Progression Factor	1.00	1.00		1.00			1.06					
Incremental Delay, d2	14.9	0.3		0.6			13.3					
Delay (s)	34.6	2.1		15.9			36.2					
Level of Service	C	A		B			D					
Approach Delay (s)	18.0			15.9			36.2			0.0		
Approach LOS	B			B			D			A		
<b>Intersection Summary</b>												
HCM 2000 Control Delay	21.8			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.91											
Actuated Cycle Length (s)	75.6			Sum of lost time (s)			14.0					
Intersection Capacity Utilization	87.6%			ICU Level of Service			E					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Unsigneded Intersection Capacity Analysis  
210: Library Lot & Washington St

Synchro 9 Report

10/18/2018



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	723	23	29	853	0	47
Future Volume (Veh/h)	723	23	29	853	0	47
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.92	0.92	0.73	0.73
Hourly flow rate (vph)	795	25	32	927	0	64
Pedestrians	2			1	26	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	2	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	186			520		
pX, platoon unblocked			0.94		0.97	0.94
vC, conflicting volume			846		1363	437
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			707		1024	271
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		100	90
cM capacity (veh/h)			828		213	673
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	530	290	341	618	64	
Volume Left	0	0	32	0	0	
Volume Right	0	25	0	0	64	
cSH	1700	1700	828	1700	673	
Volume to Capacity	0.31	0.17	0.04	0.36	0.10	
Queue Length 95th (ft)	0	0	3	0	8	
Control Delay (s)	0.0	0.0	1.3	0.0	10.9	
Lane LOS			A		B	
Approach Delay (s)	0.0		0.5		10.9	
Approach LOS					B	
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			55.0%		ICU Level of Service	A
Analysis Period (min)			15			

Intersection						
Int Delay, s/veh	0.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Traffic Vol, veh/h	723	23	29	853	0	47
Future Vol, veh/h	723	23	29	853	0	47
Conflicting Peds, #/hr	0	26	26	0	2	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	92	92	73	73
Heavy Vehicles, %	2	0	0	1	0	0
Mvmt Flow	795	25	32	927	0	64
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	846	0	-	437
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	4.1	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.2	-	-	3.3
Pot Cap-1 Maneuver	-	-	800	-	0	573
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	799	-	-	560
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0.7	12.3			
HCM LOS			B			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	560	-	-	799	-	
HCM Lane V/C Ratio	0.115	-	-	0.039	-	
HCM Control Delay (s)	12.3	-	-	9.7	0.4	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-	

HCM Unsignalized Intersection Capacity Analysis  
220: Grove St & Spring St

Synchro 9 Report  
10/18/2018



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (veh/h)	76	70	118	18	10	114
Future Volume (Veh/h)	76	70	118	18	10	114
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.65	0.65	0.79	0.79	0.94	0.94
Hourly flow rate (vph)	117	108	149	23	11	121
Pedestrians	10		3			12
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	1		0			1
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (ft)						285
pX, platoon unblocked						
vC, conflicting volume	316	182			182	
vc1, stage 1 conf vol						
vc2, stage 2 conf vol						
vCu, unblocked vol	316	182			182	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	82	87			99	
cm capacity (veh/h)	662	847			1394	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	225	172	132			
Volume Left	117	0	11			
Volume Right	108	23	0			
cSH	739	1700	1394			
Volume to Capacity	0.30	0.10	0.01			
Queue Length 95th (ft)	32	0	1			
Control Delay (s)	12.0	0.0	0.7			
Lane LOS	B		A			
Approach Delay (s)	12.0	0.0	0.7			
Approach LOS	B					
Intersection Summary						
Average Delay		5.3				
Intersection Capacity Utilization		31.4%		ICU Level of Service		A
Analysis Period (min)		15				

Intersection

Int Delay, s/veh 5.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	B		A		
Traffic Vol, veh/h	76	70	118	18	10	114
Future Vol, veh/h	76	70	118	18	10	114
Conflicting Peds, #/hr	3	12	0	10	10	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	65	65	79	79	94	94
Heavy Vehicles, %	3	1	0	2	0	0
Mvmt Flow	117	108	149	23	11	121

Major/Minor	Minor1	Major1	Major2	
Conflicting Flow All	317	183	0	0 182 0
Stage 1	171	-	-	- - -
Stage 2	146	-	-	- - -
Critical Hdwy	6.43	6.21	-	- 4.1 -
Critical Hdwy Stg 1	5.43	-	-	- - -
Critical Hdwy Stg 2	5.43	-	-	- - -
Follow-up Hdwy	3.527	3.309	-	- 2.2 -
Pot Cap-1 Maneuver	674	862	-	- 1405 -
Stage 1	857	-	-	- - -
Stage 2	879	-	-	- - -
Platoon blocked, %	-	-	-	- - -
Mov Cap-1 Maneuver	661	846	-	- 1391 -
Mov Cap-2 Maneuver	661	-	-	- - -
Stage 1	850	-	-	- - -
Stage 2	870	-	-	- - -

Approach	WB	NB	SB
HCM Control Delay, s	12	0	0.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	738	1391	-
HCM Lane V/C Ratio	-	-	0.304	0.008	-
HCM Control Delay (s)	-	-	12	7.6	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1.3	0	-

HCM Unsignalized Intersection Capacity Analysis  
230: Grove St & Hampden St

Synchro 9 Report  
10/18/2018



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	116	37	94	78	20	157
Future Volume (Veh/h)	116	37	94	78	20	157
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.75	0.75	0.92	0.92	0.75	0.75
Hourly flow rate (vph)	155	49	102	85	27	209
Pedestrians	2					13
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	0					1
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	410	160			189	
vc1, stage 1 conf vol						
vc2, stage 2 conf vol						
vCu, unblocked vol	410	160			189	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	74	94			98	
cm capacity (veh/h)	589	872			1395	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	204	187	236			
Volume Left	155	0	27			
Volume Right	49	85	0			
cSH	639	1700	1395			
Volume to Capacity	0.32	0.11	0.02			
Queue Length 95th (ft)	34	0	1			
Control Delay (s)	13.2	0.0	1.0			
Lane LOS	B		A			
Approach Delay (s)	13.2	0.0	1.0			
Approach LOS	B					
Intersection Summary						
Average Delay		4.7				
Intersection Capacity Utilization		39.9%		ICU Level of Service		A
Analysis Period (min)		15				

Intersection

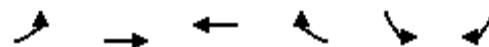
Int Delay, s/veh 4.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	B	N			
Traffic Vol, veh/h	116	37	94	78	20	157
Future Vol, veh/h	116	37	94	78	20	157
Conflicting Peds, #/hr	0	13	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	75	92	92	75	75
Heavy Vehicles, %	0	3	0	1	0	1
Mvmt Flow	155	49	102	85	27	209

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	410	160	0	0	189
Stage 1	147	-	-	-	-
Stage 2	263	-	-	-	-
Critical Hdwy	6.4	6.23	-	-	4.1
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.327	-	-	2.2
Pot Cap-1 Maneuver	602	882	-	-	1397
Stage 1	885	-	-	-	-
Stage 2	786	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	588	871	-	-	1382
Mov Cap-2 Maneuver	588	-	-	-	-
Stage 1	884	-	-	-	-
Stage 2	769	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.3	0	0.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	638	1382	-
HCM Lane V/C Ratio	-	-	0.32	0.019	-
HCM Control Delay (s)	-	-	13.3	7.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1.4	0.1	-



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	47	47	131	51	2	7
Future Volume (Veh/h)	47	47	131	51	2	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.67	0.67	0.88	0.88	0.56	0.56
Hourly flow rate (vph)	70	70	149	58	4	13
Pedestrians		1	15		5	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	212			408	184	
vc1, stage 1 conf vol						
vc2, stage 2 conf vol						
vCu, unblocked vol	212			408	184	
tC, single (s)	4.1			6.4	6.3	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.4	
p0 queue free %	95			99	98	
cm capacity (veh/h)	1353			563	824	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	140	207	17			
Volume Left	70	0	4			
Volume Right	0	58	13			
cSH	1353	1700	743			
Volume to Capacity	0.05	0.12	0.02			
Queue Length 95th (ft)	4	0	2			
Control Delay (s)	4.1	0.0	10.0			
Lane LOS	A		A			
Approach Delay (s)	4.1	0.0	10.0			
Approach LOS			A			
Intersection Summary						
Average Delay		2.0				
Intersection Capacity Utilization		29.4%		ICU Level of Service		A
Analysis Period (min)		15				

**Intersection**

Int Delay, s/veh 1.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	47	47	131	51	2	7
Future Vol, veh/h	47	47	131	51	2	7
Conflicting Peds, #/hr	5	0	0	5	15	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	67	67	88	88	56	56
Heavy Vehicles, %	2	0	0	4	0	14
Mvmt Flow	70	70	149	58	4	13

Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	212	0	-	0	408	184
Stage 1	-	-	-	-	183	-
Stage 2	-	-	-	-	225	-
Critical Hdwy	4.12	-	-	-	6.4	6.34
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.218	-	-	-	3.5	3.426
Pot Cap-1 Maneuver	1358	-	-	-	603	828
Stage 1	-	-	-	-	853	-
Stage 2	-	-	-	-	817	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1357	-	-	-	566	824
Mov Cap-2 Maneuver	-	-	-	-	566	-
Stage 1	-	-	-	-	849	-
Stage 2	-	-	-	-	770	-

Approach	EB	WB	SB			
HCM Control Delay, s	3.9	0	9.9			
HCM LOS			A			

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1357	-	-	-	748	
HCM Lane V/C Ratio	0.052	-	-	-	0.021	
HCM Control Delay (s)	7.8	0	-	-	9.9	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0.2	-	-	-	0.1	

HCM Unsignalized Intersection Capacity Analysis  
250: Brook St & Hampden St

Synchro 9 Report  
10/18/2018

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	16	31	123	24	48	51
Future Volume (Veh/h)	16	31	123	24	48	51
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.69	0.69	0.88	0.88	0.92	0.92
Hourly flow rate (vph)	23	45	140	27	52	55
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (ft)					1034	
pX, platoon unblocked						
vC, conflicting volume	386	80	107			
vc1, stage 1 conf vol						
vc2, stage 2 conf vol						
vCu, unblocked vol	386	80	107			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	95	91			
cm capacity (veh/h)	563	986	1497			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	68	167	107			
Volume Left	23	140	0			
Volume Right	45	0	55			
cSH	786	1497	1700			
Volume to Capacity	0.09	0.09	0.06			
Queue Length 95th (ft)	7	8	0			
Control Delay (s)	10.0	6.5	0.0			
Lane LOS	B	A				
Approach Delay (s)	10.0	6.5	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay		5.2				
Intersection Capacity Utilization		24.7%		ICU Level of Service		A
Analysis Period (min)		15				

**Intersection**

Int Delay, s/veh 5.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
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Lane Configurations						
Traffic Vol, veh/h	16	31	123	24	48	51
Future Vol, veh/h	16	31	123	24	48	51
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	69	69	88	88	92	92
Heavy Vehicles, %	0	0	0	0	0	4
Mvmt Flow	23	45	140	27	52	55

Major/Minor	Minor2	Major1	Major2
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Conflicting Flow All	387	80	108	0	-	0
Stage 1	80	-	-	-	-	-
Stage 2	307	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	620	986	1495	-	-	-
Stage 1	948	-	-	-	-	-
Stage 2	751	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	561	986	1495	-	-	-
Mov Cap-2 Maneuver	561	-	-	-	-	-
Stage 1	948	-	-	-	-	-
Stage 2	680	-	-	-	-	-

Approach	EB	NB	SB
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HCM Control Delay, s	10	6.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1495	-	784	-	-
HCM Lane V/C Ratio	0.093	-	0.087	-	-
HCM Control Delay (s)	7.7	0	10	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.3	-	-

## Queues

Synchro 9 Report

10: Washington St &amp; Grove St &amp; Central St

10/18/2018



Lane Group	EBL	EBT	WBL2	WBL	WBT	NBL2	NBL	NBT	SBL	SBT	NER	Ø9
Lane Configurations												
Traffic Volume (vph)	1	391	5	316	463	10	121	15	31	9	222	
Future Volume (vph)	1	391	5	316	463	10	121	15	31	9	222	
Lane Group Flow (vph)	0	565	0	357	544	0	0	220	0	71	244	
Turn Type	Perm	NA	custom	Prot	NA	Perm	Perm	NA	Perm	NA	Over	
Protected Phases		2		1	6			8		4	1	9
Permitted Phases	2		1			8	8		4			
Detector Phase	2	2	1	1	6	8	8	8	4	4	1	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	6.0	6.0	6.0	6.0	6.0	7.0	1.0
Minimum Split (s)	12.0	12.0	20.0	20.0	12.0	11.0	11.0	11.0	11.0	11.0	20.0	32.0
Total Split (s)	30.0	30.0	32.0	32.0	62.0	18.0	18.0	18.0	18.0	18.0	32.0	32.0
Total Split (%)	26.8%	26.8%	28.6%	28.6%	55.4%	16.1%	16.1%	16.1%	16.1%	16.1%	28.6%	29%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lost Time Adjust (s)								0.0		0.0	0.0	
Total Lost Time (s)					5.0	5.0		5.0		5.0	5.0	
Lead/Lag	Lag	Lag	Lead	Lead								Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								Yes
Recall Mode	Min	Min	None	None	Min	None	None	None	None	None	None	None
v/c Ratio	0.73		5.03	0.52				1.18		0.39	0.31	
Control Delay	39.5		1845.9	9.9				162.2		48.0	29.6	
Queue Delay	0.0		0.0	0.3				0.0		0.0	0.0	
Total Delay	39.5		1845.9	10.2				162.2		48.0	29.6	
Queue Length 50th (ft)	124		~340	94				~123		32	50	
Queue Length 95th (ft)	#302		#686	392				#351		90	126	
Internal Link Dist (ft)	525			238				205		238		
Turn Bay Length (ft)											100	
Base Capacity (vph)	817		71	1079				186		184	778	
Starvation Cap Reductn	0		0	149				0		0	0	
Spillback Cap Reductn	0		0	0				0		0	0	
Storage Cap Reductn	0		0	0				0		0	0	
Reduced v/c Ratio	0.69		5.03	0.58				1.18		0.39	0.31	

## Intersection Summary

Cycle Length: 112

Actuated Cycle Length: 91.6

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

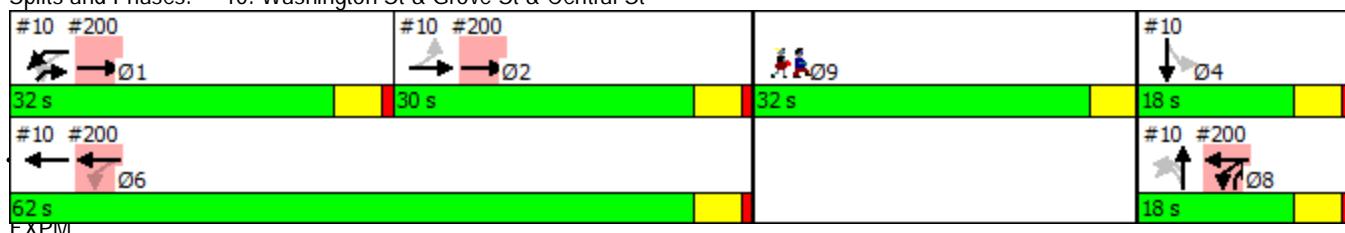
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 10: Washington St &amp; Grove St &amp; Central St

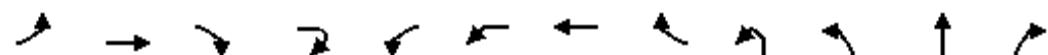


## HCM Signalized Intersection Capacity Analysis

Synchro 9 Report

10: Washington St &amp; Grove St &amp; Central St

10/18/2018



Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR
Lane Configurations												
Traffic Volume (vph)	1	391	106	28	5	316	463	27	10	121	15	43
Future Volume (vph)	1	391	106	28	5	316	463	27	10	121	15	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	-4%						0%				0%	
Total Lost time (s)	5.0					5.0	5.0				5.0	
Lane Util. Factor	0.95					1.00	1.00				1.00	
Frpb, ped/bikes	0.96					1.00	1.00				0.99	
Fpb, ped/bikes	1.00					0.97	1.00				0.99	
Fr	0.96					1.00	0.99				0.97	
Flt Protected	1.00					0.95	1.00				0.97	
Satd. Flow (prot)	3041					1577	1678				1561	
Flt Permitted	0.95					0.14	1.00				0.79	
Satd. Flow (perm)	2903					238	1678				1277	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.90	0.90	0.90	0.90	0.86	0.86	0.86	0.86
Adj. Flow (vph)	1	420	114	30	6	351	514	30	12	141	17	50
RTOR Reduction (vph)	0	4	0	0	0	0	2	0	0	0	0	0
Lane Group Flow (vph)	0	561	0	0	0	357	542	0	0	0	220	0
Confl. Peds. (#/hr)	8		33	33	33	33		8		9		11
Confl. Bikes (#/hr)												
Heavy Vehicles (%)	0%	1%	1%	0%	25%	0%	1%	0%	0%	1%	0%	0%
Turn Type	Perm	NA			custom	Prot	NA		Perm	Perm	NA	
Protected Phases		2					1	6			8	
Permitted Phases	2				1				8	8		
Actuated Green, G (s)	24.5					27.9	57.4				13.4	
Effective Green, g (s)	24.5					27.9	57.4				13.4	
Actuated g/C Ratio	0.26					0.30	0.61				0.14	
Clearance Time (s)	5.0					5.0	5.0				5.0	
Vehicle Extension (s)	3.0					3.0	3.0				3.0	
Lane Grp Cap (vph)	756					70	1024				182	
v/s Ratio Prot							0.32					
v/s Ratio Perm	c0.19					c1.50					c0.17	
v/c Ratio	0.74					5.10	0.53				1.21	
Uniform Delay, d1	31.9					33.0	10.5				40.3	
Progression Factor	1.00					0.89	0.61				1.00	
Incremental Delay, d2	4.0					1874.3	0.5				134.1	
Delay (s)	35.8					1903.8	6.9				174.4	
Level of Service	D					F	A				F	
Approach Delay (s)	35.8						758.5				174.4	
Approach LOS	D						F				F	

## Intersection Summary

HCM 2000 Control Delay	375.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.34		
Actuated Cycle Length (s)	94.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
10: Washington St & Grove St & Central St

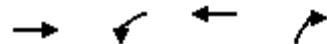
Synchro 9 Report  
10/18/2018



Movement	SBL	SBT	SBR	SBR2	NER
Lane Configurations					
Traffic Volume (vph)	31	9	14	5	222
Future Volume (vph)	31	9	14	5	222
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Grade (%)	-2%				
Total Lost time (s)	5.0				5.0
Lane Util. Factor	1.00				0.88
Frpb, ped/bikes	0.97				1.00
Fpb, ped/bikes	0.99				1.00
Fr	0.96				0.85
Flt Protected	0.97				1.00
Satd. Flow (prot)	1525				2558
Flt Permitted	0.81				1.00
Satd. Flow (perm)	1266				2558
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.91
Adj. Flow (vph)	37	11	17	6	244
RTOR Reduction (vph)	0	0	0	0	0
Lane Group Flow (vph)	0	71	0	0	244
Confl. Peds. (#/hr)	11		33	9	11
Confl. Bikes (#/hr)					1
Heavy Vehicles (%)	3%	0%	0%	0%	0%
Turn Type	Perm	NA			Over
Protected Phases		4			1
Permitted Phases		4			
Actuated Green, G (s)	13.4				27.9
Effective Green, g (s)	13.4				27.9
Actuated g/C Ratio	0.14				0.30
Clearance Time (s)	5.0				5.0
Vehicle Extension (s)	3.0				3.0
Lane Grp Cap (vph)	180				759
v/s Ratio Prot					0.10
v/s Ratio Perm		0.06			
v/c Ratio		0.39			0.32
Uniform Delay, d1	36.6				25.7
Progression Factor	1.00				1.00
Incremental Delay, d2	1.4				0.2
Delay (s)	38.0				25.9
Level of Service	D				C
Approach Delay (s)	38.0				
Approach LOS	D				
Intersection Summary					

Queues  
200: Cameron St & Washington St

Synchro 9 Report  
10/18/2018



Lane Group	EBT	WBL	WBT	NBR	Ø1	Ø2	Ø4	Ø6	Ø9
Lane Configurations									
Traffic Volume (vph)	654	42	811	68					
Future Volume (vph)	654	42	811	68					
Lane Group Flow (vph)	708	0	928	92					
Turn Type	NA	custom	NA	Over					
Protected Phases	2 1	8	6 8	8	1	2	4	6	9
Permitted Phases					6	8			
Detector Phase	2 1	8	6 8	8					
Switch Phase									
Minimum Initial (s)		6.0		6.0	7.0	7.0	6.0	7.0	1.0
Minimum Split (s)		11.0		11.0	20.0	12.0	11.0	12.0	32.0
Total Split (s)		18.0		18.0	32.0	30.0	18.0	62.0	32.0
Total Split (%)		16.1%		16.1%	29%	27%	16%	55%	29%
Yellow Time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)		1.0		1.0	1.0	1.0	1.0	1.0	0.0
Lost Time Adjust (s)					0.0				
Total Lost Time (s)					5.0				
Lead/Lag					Lead	Lag			
Lead-Lag Optimize?					Yes	Yes			
Recall Mode		None		None	None	Min	None	Min	None
v/c Ratio	0.35		0.41		0.15				
Control Delay	6.0		5.7		0.5				
Queue Delay	0.3		0.0		0.0				
Total Delay	6.3		5.7		0.5				
Queue Length 50th (ft)	27		0		0				
Queue Length 95th (ft)	m94		187		0				
Internal Link Dist (ft)	238		106						
Turn Bay Length (ft)									
Base Capacity (vph)	2050		2313		626				
Starvation Cap Reductn	692		0		0				
Spillback Cap Reductn	0		48		0				
Storage Cap Reductn	0		0		0				
Reduced v/c Ratio	0.52		0.41		0.15				

#### Intersection Summary

Cycle Length: 112

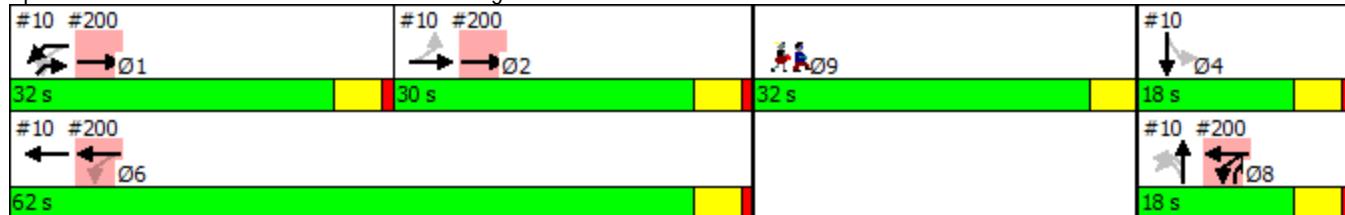
Actuated Cycle Length: 91.6

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

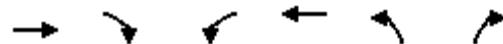
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 200: Cameron St & Washington St



HCM Signalized Intersection Capacity Analysis  
200: Cameron St & Washington St

Synchro 9 Report  
10/18/2018



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	654	33	42	811	0	68
Future Volume (vph)	654	33	42	811	0	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0		5.0
Lane Util. Factor	0.95			0.95		1.00
Frpb, ped/bikes	1.00			1.00		1.00
Flpb, ped/bikes	1.00			1.00		1.00
Fr <sub>t</sub>	0.99			1.00		0.86
Flt Protected	1.00			1.00		1.00
Satd. Flow (prot)	3187			3209		1450
Flt Permitted	1.00			0.89		1.00
Satd. Flow (perm)	3187			2874		1450
Peak-hour factor, PHF	0.97	0.97	0.92	0.92	0.74	0.74
Adj. Flow (vph)	674	34	46	882	0	92
RTOR Reduction (vph)	3	0	0	0	0	79
Lane Group Flow (vph)	705	0	0	928	0	13
Confl. Peds. (#/hr)		35	35		41	
Confl. Bikes (#/hr)			4			
Heavy Vehicles (%)	1%	0%	0%	1%	0%	2%
Turn Type	NA	custom	NA		Over	
Protected Phases	2 1		8	6 8		8
Permitted Phases			6			8
Actuated Green, G (s)	57.4			70.8		13.4
Effective Green, g (s)	57.4			70.8		13.4
Actuated g/C Ratio	0.61			0.75		0.14
Clearance Time (s)					5.0	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)	1946			2212		206
v/s Ratio Prot	0.22		c0.06		0.01	
v/s Ratio Perm			c0.26			
v/c Ratio	0.36		0.42		0.06	
Uniform Delay, d1	9.2		4.2		34.9	
Progression Factor	0.52		1.00		1.00	
Incremental Delay, d2	0.1		0.1		0.1	
Delay (s)	4.8		4.3		35.0	
Level of Service	A		A		D	
Approach Delay (s)	4.8		4.3	35.0		
Approach LOS	A		A	D		
<b>Intersection Summary</b>						
HCM 2000 Control Delay	6.2		HCM 2000 Level of Service		A	
HCM 2000 Volume to Capacity ratio	0.40					
Actuated Cycle Length (s)	94.0		Sum of lost time (s)		19.0	
Intersection Capacity Utilization	56.0%		ICU Level of Service		B	
Analysis Period (min)	15					
c Critical Lane Group						

## Queues

11: Wellesley Ave/Town Hall &amp; Washington St

Synchro 9 Report

06/03/2019



Lane Group	EBT	EBC	WBL	WBT	NBT	Ø4	Ø7	Ø9
Lane Configurations	4	1		4 1	4			
Traffic Volume (vph)	356	401	120	466	0			
Future Volume (vph)	356	401	120	466	0			
Lane Group Flow (vph)	367	413	0	637	514			
Turn Type	NA	pm+ov	pm+pt	NA	NA			
Protected Phases	2	4 7	1	6	4 7	4	7	9
Permitted Phases	2	2	6	6 1				
Detector Phase	2	4 7	1	6	4 7			
Switch Phase								
Minimum Initial (s)	7.0		6.0	7.0		7.0	7.0	5.0
Minimum Split (s)	11.0		10.0	11.0		11.0	11.0	20.0
Total Split (s)	33.0		10.0	43.0		26.0	11.0	20.0
Total Split (%)	33.0%		10.0%	43.0%		26%	11%	20%
Yellow Time (s)	3.0		3.0	3.0		3.0	3.0	2.0
All-Red Time (s)	1.0		1.0	1.0		1.0	1.0	0.0
Lost Time Adjust (s)	0.0		0.0					
Total Lost Time (s)	4.0		4.0					
Lead/Lag	Lag		Lead			Lag	Lead	
Lead-Lag Optimize?	Yes		Yes			Yes	Yes	
Recall Mode	Min		None	Min		None	None	None
v/c Ratio	0.73	0.34		0.69	0.76			
Control Delay	35.4	1.4		22.5	39.7			
Queue Delay	0.0	0.4		0.0	0.0			
Total Delay	35.4	1.8		22.5	39.7			
Queue Length 50th (ft)	146	0		102	265			
Queue Length 95th (ft)	#329	30		214	#561			
Internal Link Dist (ft)	440			812	7			
Turn Bay Length (ft)								
Base Capacity (vph)	638	1199		1086	674			
Starvation Cap Reductn	0	0		0	0			
Spillback Cap Reductn	0	369		0	0			
Storage Cap Reductn	0	0		0	0			
Reduced v/c Ratio	0.58	0.50		0.59	0.76			

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 78.4

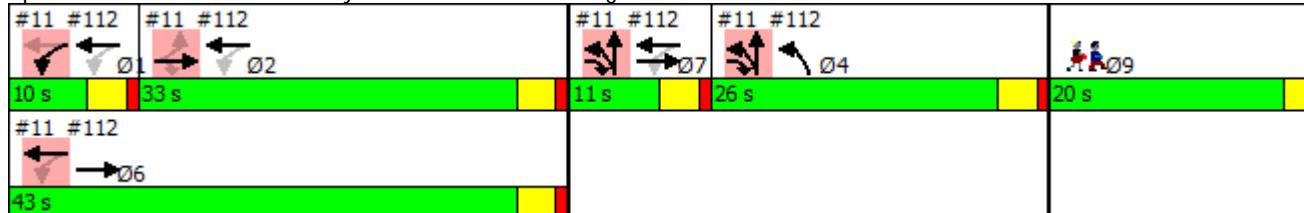
Natural Cycle: 90

Control Type: Actuated-Uncoordinated

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 11: Wellesley Ave/Town Hall &amp; Washington St



HCM Signalized Intersection Capacity Analysis  
11: Wellesley Ave/Town Hall & Washington St

Synchro 9 Report  
06/03/2019



Movement	EBL	EBT	EBC	WBL	WBT	WBC	NBL	NBT	NBC	SBL	SBT	SBC
Lane Configurations												
Traffic Volume (vph)	0	356	401	120	466	0	449	0	49	0	0	0
Future Volume (vph)	0	356	401	120	466	0	449	0	49	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0			4.0				
Lane Util. Factor	1.00	1.00		0.95			1.00					
Frpb, ped/bikes	1.00	1.00		1.00			1.00					
Flpb, ped/bikes	1.00	1.00		1.00			1.00					
Fr <sub>t</sub>	1.00	0.85		1.00			0.99					
Flt Protected	1.00	1.00		0.99			0.96					
Satd. Flow (prot)	1693	1425		3153			1569					
Flt Permitted	1.00	1.00		0.61			0.96					
Satd. Flow (perm)	1693	1425		1955			1569					
Peak-hour factor, PHF	0.97	0.97	0.97	0.92	0.92	0.92	0.97	0.97	0.97	0.92	0.92	0.92
Adj. Flow (vph)	0	367	413	130	507	0	463	0	51	0	0	0
RTOR Reduction (vph)	0	0	119	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	367	294	0	637	0	0	514	0	0	0	0
Confl. Peds. (#/hr)	2				2	2						
Heavy Vehicles (%)	0%	1%	2%	2%	2%	0%	3%	0%	2%	0%	0%	0%
Turn Type	NA	pm+ov	pm+pt	NA			Split	NA				
Protected Phases	2	4 7	1	6			4 7	4 7				
Permitted Phases	2	2	2	6	6 1							
Actuated Green, G (s)	23.3	56.9		33.4			33.6					
Effective Green, g (s)	23.3	56.9		33.4			33.6					
Actuated g/C Ratio	0.29	0.71		0.42			0.42					
Clearance Time (s)	4.0		4.0									
Vehicle Extension (s)	3.0		3.0									
Lane Grp Cap (vph)	494	1087		909			660					
v/s Ratio Prot	0.22	0.11		c0.05			c0.33					
v/s Ratio Perm		0.09		c0.24								
v/c Ratio	0.74	0.27		0.70			0.78					
Uniform Delay, d1	25.5	4.1		19.1			19.9					
Progression Factor	1.00	1.00		1.00			1.46					
Incremental Delay, d2	6.0	0.1		2.5			5.4					
Delay (s)	31.5	4.2		21.5			34.5					
Level of Service	C	A		C			C					
Approach Delay (s)	17.1		21.5				34.5		0.0			
Approach LOS	B		C				C		A			

Intersection Summary

HCM 2000 Control Delay	23.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	79.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

## Timings

## Synchro 9 Report

10: Washington St &amp; Grove St &amp; Central St

05/29/2019



Lane Group	EBT	WBL2	WBL	WBT	NBL2	NBL	NBT	SBL	SBT	NER	Ø9
Lane Configurations											
Traffic Volume (vph)	729	8	188	459	6	139	21	40	23	479	
Future Volume (vph)	729	8	188	459	6	139	21	40	23	479	
Lane Group Flow (vph)	923	0	213	538	0	0	258	0	92	545	
Turn Type	NA	custom	Prot	NA	Perm	Perm	NA	Perm	NA	Over	
Protected Phases	2		1	6			8		4	1	9
Permitted Phases			1		8	8		4			
Detector Phase	2	1	1	6	8	8	8	4	4	1	
Switch Phase											
Minimum Initial (s)	7.0	7.0	7.0	7.0	6.0	6.0	6.0	6.0	6.0	7.0	1.0
Minimum Split (s)	12.0	12.0	12.0	12.0	11.0	11.0	11.0	11.0	11.0	12.0	32.0
Total Split (s)	42.0	36.0	36.0	78.0	30.0	30.0	30.0	30.0	30.0	36.0	32.0
Total Split (%)	30.0%	25.7%	25.7%	55.7%	21.4%	21.4%	21.4%	21.4%	21.4%	25.7%	23%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lost Time Adjust (s)	0.0		0.0			0.0			0.0		0.0
Total Lost Time (s)	5.0		5.0			5.0			5.0		5.0
Lead/Lag	Lag	Lead	Lead							Lead	
Lead-Lag Optimize?	Yes	Yes	Yes							Yes	
Recall Mode	Min	None	None	Min	None	None	None	None	None	None	None
v/c Ratio	0.93		4.02	0.53			1.03		0.35	0.76	
Control Delay	58.0		1400.7	15.1			113.3		49.3	44.2	
Queue Delay	0.0		0.0	0.6			23.6		0.3	2.3	
Total Delay	58.0		1400.7	15.7			136.9		49.6	46.5	
Queue Length 50th (ft)	308		~267	138			176		53	161	
Queue Length 95th (ft)	#601		#532	460			#428		109	#328	
Internal Link Dist (ft)	525			238			205		238		
Turn Bay Length (ft)										100	
Base Capacity (vph)	989		53	1018			250		261	716	
Starvation Cap Reductn	0		0	189			0		0	0	
Spillback Cap Reductn	0		0	0			19		20	79	
Storage Cap Reductn	0		0	0			0		0	0	
Reduced v/c Ratio	0.93		4.02	0.65			1.12		0.38	0.86	

## Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 120.8

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

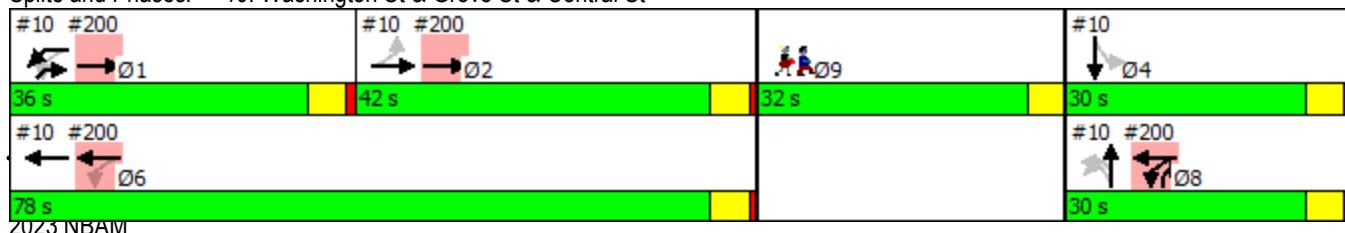
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 10: Washington St &amp; Grove St &amp; Central St

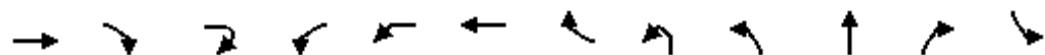


## HCM Signalized Intersection Capacity Analysis

Synchro 9 Report

10: Washington St &amp; Grove St &amp; Central St

05/29/2019



Movement	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	729	67	7	8	188	459	36	6	139	21	53	40
Future Volume (vph)	729	67	7	8	188	459	36	6	139	21	53	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	-4%					0%				0%		
Total Lost time (s)	5.0				5.0	5.0				5.0		
Lane Util. Factor	0.95					1.00	1.00			1.00		
Frpb, ped/bikes	1.00					1.00	1.00			0.99		
Flpb, ped/bikes	1.00					1.00	1.00			0.99		
Fr <sub>t</sub>	0.99					1.00	0.99			0.97		
Flt Protected	1.00					0.95	1.00			0.97		
Satd. Flow (prot)	3180					1540	1656			1544		
Flt Permitted	1.00					0.13	1.00			0.75		
Satd. Flow (perm)	3180					206	1656			1194		
Peak-hour factor, PHF	0.87	0.87	0.87	0.92	0.92	0.92	0.92	0.85	0.85	0.85	0.85	0.75
Adj. Flow (vph)	838	77	8	9	204	499	39	7	164	25	62	53
RTOR Reduction (vph)	1	0	0	0	0	2	0	0	0	0	0	0
Lane Group Flow (vph)	922	0	0	0	213	536	0	0	0	258	0	0
Confl. Peds. (#/hr)	5	5	5	5			16		16		11	11
Confl. Bikes (#/hr)	5	5				2						
Heavy Vehicles (%)	2%	6%	0%	33%	4%	2%	0%	0%	2%	0%	2%	3%
Turn Type	NA			custom	Prot	NA		Perm	Perm	NA		Perm
Protected Phases	2					1	6				8	
Permitted Phases				1				8	8			4
Actuated Green, G (s)	37.7				31.5	74.2				25.4		
Effective Green, g (s)	37.7				31.5	74.2				25.4		
Actuated g/C Ratio	0.31				0.26	0.60				0.21		
Clearance Time (s)	5.0				5.0	5.0				5.0		
Vehicle Extension (s)	3.0				3.0	3.0				3.0		
Lane Grp Cap (vph)	972				52	996				245		
v/s Ratio Prot	c0.29					0.32						
v/s Ratio Perm					c1.03					c0.22		
v/c Ratio	0.95				4.10	0.54				1.05		
Uniform Delay, d1	41.9				45.9	14.5				49.0		
Progression Factor	1.00				0.94	0.79				1.00		
Incremental Delay, d2	17.6				1436.0	0.5				72.1		
Delay (s)	59.5				1479.3	12.0				121.1		
Level of Service	E				F	B				F		
Approach Delay (s)	59.5					428.1				121.1		
Approach LOS	E					F				F		

## Intersection Summary

HCM 2000 Control Delay	170.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.82		
Actuated Cycle Length (s)	123.3	Sum of lost time (s)	19.0
Intersection Capacity Utilization	108.7%	ICU Level of Service	G
Analysis Period (min)	15		

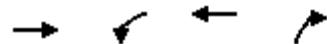
c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
10: Washington St & Grove St & Central St

Synchro 9 Report  
05/29/2019



Movement	SBT	SBR	SBR2	NER	NER2
Lane Configurations					
Traffic Volume (vph)	23	5	1	479	1
Future Volume (vph)	23	5	1	479	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Grade (%)	-2%				
Total Lost time (s)	5.0			5.0	
Lane Util. Factor	1.00			0.88	
Frpb, ped/bikes	1.00			1.00	
Flpb, ped/bikes	1.00			1.00	
Fr <sub>t</sub>	0.99			0.85	
Flt Protected	0.97			1.00	
Satd. Flow (prot)	1591			2504	
Flt Permitted	0.76			1.00	
Satd. Flow (perm)	1242			2504	
Peak-hour factor, PHF	0.75	0.75	0.75	0.88	0.88
Adj. Flow (vph)	31	7	1	544	1
RTOR Reduction (vph)	0	0	0	64	0
Lane Group Flow (vph)	92	0	0	481	0
Confl. Peds. (#/hr)		5	16	11	
Confl. Bikes (#/hr)					
Heavy Vehicles (%)	5%	0%	0%	2%	100%
Turn Type	NA			Over	
Protected Phases	4			1	
Permitted Phases					
Actuated Green, G (s)	25.4			31.5	
Effective Green, g (s)	25.4			31.5	
Actuated g/C Ratio	0.21			0.26	
Clearance Time (s)	5.0			5.0	
Vehicle Extension (s)	3.0			3.0	
Lane Grp Cap (vph)	255			639	
v/s Ratio Prot			0.19		
v/s Ratio Perm	0.07				
v/c Ratio	0.36		0.75		
Uniform Delay, d1	42.0		42.3		
Progression Factor	1.00			1.00	
Incremental Delay, d2	0.9			5.0	
Delay (s)	42.9		47.3		
Level of Service	D			D	
Approach Delay (s)	42.9				
Approach LOS	D				
Intersection Summary					



Lane Group	EBT	WBL	WBT	NBR	Ø1	Ø2	Ø4	Ø6	Ø9
Lane Configurations	↑↓		↑↓	↑					
Traffic Volume (vph)	1277	28	692	77					
Future Volume (vph)	1277	28	692	77					
Lane Group Flow (vph)	1494	0	774	145					
Turn Type	NA	custom	NA	Over					
Protected Phases	2 1	8	6 8	8	1	2	4	6	9
Permitted Phases					6	8			
Detector Phase	2 1	8	6 8	8					
Switch Phase									
Minimum Initial (s)		6.0		6.0	7.0	7.0	6.0	7.0	1.0
Minimum Split (s)		11.0		11.0	12.0	12.0	11.0	12.0	32.0
Total Split (s)		30.0		30.0	36.0	42.0	30.0	78.0	32.0
Total Split (%)		21.4%		21.4%	26%	30%	21%	56%	23%
Yellow Time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)		1.0		1.0	1.0	1.0	1.0	1.0	0.0
Lost Time Adjust (s)					0.0				
Total Lost Time (s)					5.0				
Lead/Lag					Lead	Lag			
Lead-Lag Optimize?					Yes	Yes			
Recall Mode		None		None	None	Min	None	Min	None
v/c Ratio	0.76		0.33	0.25					
Control Delay	11.2		3.8	1.1					
Queue Delay	2.1		0.0	0.0					
Total Delay	13.3		3.8	1.1					
Queue Length 50th (ft)	77		0	0					
Queue Length 95th (ft)	m292		143	0					
Internal Link Dist (ft)	238		106						
Turn Bay Length (ft)									
Base Capacity (vph)	1969		2379	571					
Starvation Cap Reductn	322		0	0					
Spillback Cap Reductn	0		90	0					
Storage Cap Reductn	0		0	0					
Reduced v/c Ratio	0.91		0.34	0.25					

#### Intersection Summary

Cycle Length: 140

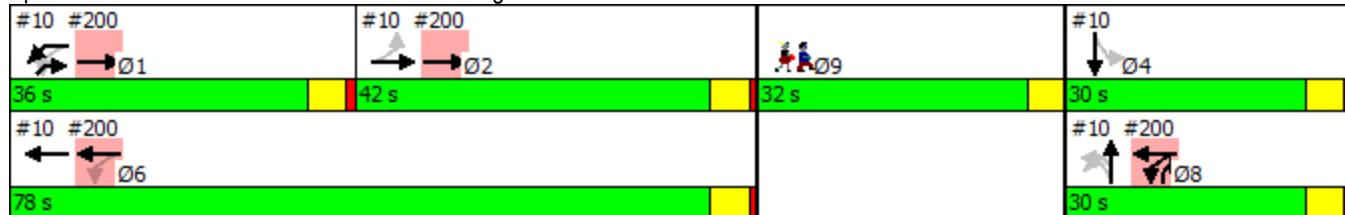
Actuated Cycle Length: 120.8

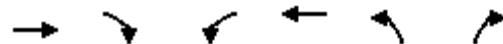
Natural Cycle: 90

Control Type: Actuated-Uncoordinated

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 200: Cameron St & Washington St





Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1277	23	28	692	0	77
Future Volume (vph)	1277	23	28	692	0	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0		5.0
Lane Util. Factor	0.95			0.95		1.00
Frpb, ped/bikes	1.00			1.00		1.00
Flpb, ped/bikes	1.00			1.00		1.00
Fr <sub>t</sub>	1.00			1.00		0.86
Flt Protected	1.00			1.00		1.00
Satd. Flow (prot)	3207			3212		1465
Flt Permitted	1.00			0.86		1.00
Satd. Flow (perm)	3207			2775		1465
Peak-hour factor, PHF	0.87	0.87	0.93	0.93	0.53	0.53
Adj. Flow (vph)	1468	26	30	744	0	145
RTOR Reduction (vph)	1	0	0	0	0	115
Lane Group Flow (vph)	1493	0	0	774	0	30
Confl. Peds. (#/hr)	14	14		18	2	
Confl. Bikes (#/hr)	5				1	
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Turn Type	NA	custom	NA		Over	
Protected Phases	2 1		8	6 8		8
Permitted Phases			6			8
Actuated Green, G (s)	74.2			99.6		25.4
Effective Green, g (s)	74.2			99.6		25.4
Actuated g/C Ratio	0.60			0.81		0.21
Clearance Time (s)					5.0	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)	1929			2331		301
v/s Ratio Prot	c0.47			c0.07		0.02
v/s Ratio Perm			0.20			
v/c Ratio	0.77			0.33		0.10
Uniform Delay, d1	18.3			3.1		39.7
Progression Factor	0.47			1.00		1.00
Incremental Delay, d2	1.0			0.1		0.1
Delay (s)	9.5			3.2		39.8
Level of Service	A			A		D
Approach Delay (s)	9.5			3.2	39.8	
Approach LOS	A			A	D	
<b>Intersection Summary</b>						
HCM 2000 Control Delay	9.3			HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio	0.63					
Actuated Cycle Length (s)	123.3			Sum of lost time (s)		19.0
Intersection Capacity Utilization	55.5%			ICU Level of Service		B
Analysis Period (min)	15					
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis  
210: Library Lot & Washington St

Synchro 9 Report  
05/29/2019



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1342	12	12	720	0	14
Future Volume (Veh/h)	1342	12	12	720	0	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.83	0.90	0.90	0.54	0.54
Hourly flow rate (vph)	1617	14	13	800	0	26
Pedestrians	1				9	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	0				1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)	186			520		
pX, platoon unblocked			0.65		0.65	0.65
vC, conflicting volume			1640		2060	824
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			910		1555	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		100	96
cM capacity (veh/h)			489		66	705
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	1078	553	280	533	26	
Volume Left	0	0	13	0	0	
Volume Right	0	14	0	0	26	
cSH	1700	1700	489	1700	705	
Volume to Capacity	0.63	0.33	0.03	0.31	0.04	
Queue Length 95th (ft)	0	0	2	0	3	
Control Delay (s)	0.0	0.0	1.0	0.0	10.3	
Lane LOS			A		B	
Approach Delay (s)	0.0		0.3		10.3	
Approach LOS					B	
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			47.5%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
220: Grove St & Spring St

Synchro 9 Report  
05/29/2019



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (veh/h)	45	50	168	35	15	85
Future Volume (Veh/h)	45	50	168	35	15	85
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.57	0.57	0.77	0.77	0.67	0.67
Hourly flow rate (vph)	79	88	218	45	22	127
Pedestrians	16		4		13	
Lane Width (ft)	12.0		12.0		12.0	
Walking Speed (ft/s)	4.0		4.0		4.0	
Percent Blockage	1		0		1	
Right turn flare (veh)						
Median type		None			None	
Median storage veh						
Upstream signal (ft)					285	
pX, platoon unblocked						
vC, conflicting volume	432	270		279		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	432	270		279		
tC, single (s)	6.4	6.2		4.1		
tC, 2 stage (s)						
tF (s)	3.5	3.3		2.2		
p0 queue free %	86	88		98		
cM capacity (veh/h)	561	746		1278		
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	167	263	149			
Volume Left	79	0	22			
Volume Right	88	45	0			
cSH	646	1700	1278			
Volume to Capacity	0.26	0.15	0.02			
Queue Length 95th (ft)	26	0	1			
Control Delay (s)	12.5	0.0	1.3			
Lane LOS	B		A			
Approach Delay (s)	12.5	0.0	1.3			
Approach LOS	B					
Intersection Summary						
Average Delay		3.9				
Intersection Capacity Utilization		32.6%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
230: Grove St & Hampden St

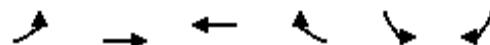
Synchro 9 Report  
05/29/2019



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		Y			Y
Traffic Volume (veh/h)	71	35	158	314	43	73
Future Volume (Veh/h)	71	35	158	314	43	73
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.72	0.72	0.85	0.85	0.92	0.92
Hourly flow rate (vph)	99	49	186	369	47	79
Pedestrians	7					12
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	1					1
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	550	390		562		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	550	390		562		
tC, single (s)	6.4	6.2		4.1		
tC, 2 stage (s)						
tF (s)	3.5	3.3		2.2		
p0 queue free %	79	92		95		
cM capacity (veh/h)	473	653		989		
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	148	555	126			
Volume Left	99	0	47			
Volume Right	49	369	0			
cSH	520	1700	989			
Volume to Capacity	0.28	0.33	0.05			
Queue Length 95th (ft)	29	0	4			
Control Delay (s)	14.6	0.0	3.6			
Lane LOS	B		A			
Approach Delay (s)	14.6	0.0	3.6			
Approach LOS	B					
Intersection Summary						
Average Delay		3.2				
Intersection Capacity Utilization		53.0%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
240: Hampden St & Cameron St

Synchro 9 Report  
05/29/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	105	198	169	82	4	13
Future Volume (Veh/h)	105	198	169	82	4	13
Sign Control	Free	Free		Stop		
Grade	0%	0%		0%		
Peak Hour Factor	0.62	0.62	0.68	0.68	0.40	0.40
Hourly flow rate (vph)	169	319	249	121	10	33
Pedestrians		1	16		3	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	1		0	
Right turn flare (veh)						
Median type	None	None				
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	373			986	314	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	373			986	314	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	86			96	95	
cM capacity (veh/h)	1177			234	729	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	488	370	43			
Volume Left	169	0	10			
Volume Right	0	121	33			
cSH	1177	1700	488			
Volume to Capacity	0.14	0.22	0.09			
Queue Length 95th (ft)	13	0	7			
Control Delay (s)	4.0	0.0	13.1			
Lane LOS	A		B			
Approach Delay (s)	4.0	0.0	13.1			
Approach LOS			B			
Intersection Summary						
Average Delay		2.8				
Intersection Capacity Utilization		43.9%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
250: Brook St & Hampden St

Synchro 9 Report  
05/29/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	84	117	168	48	45	76
Future Volume (Veh/h)	84	117	168	48	45	76
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.78	0.78	0.67	0.67
Hourly flow rate (vph)	102	143	215	62	67	113
Pedestrians	9					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	1					
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (ft)				1034		
pX, platoon unblocked						
vC, conflicting volume	624	132	189			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	624	132	189			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	73	84	84			
cM capacity (veh/h)	379	915	1381			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	245	277	180			
Volume Left	102	215	0			
Volume Right	143	0	113			
cSH	576	1381	1700			
Volume to Capacity	0.43	0.16	0.11			
Queue Length 95th (ft)	53	14	0			
Control Delay (s)	15.8	6.6	0.0			
Lane LOS	C	A				
Approach Delay (s)	15.8	6.6	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay		8.1				
Intersection Capacity Utilization		42.8%		ICU Level of Service		A
Analysis Period (min)		15				

## Queues

11: Wellesley Ave/Town Hall &amp; Washington St

Synchro 9 Report

06/03/2019



Lane Group	EBT	EBR	WBL	WBT	NBT	Ø4	Ø7	Ø9
Lane Configurations	↑	↑		↑↓	↓↑			
Traffic Volume (vph)	663	692	85	312	0			
Future Volume (vph)	663	692	85	312	0			
Lane Group Flow (vph)	705	736	0	447	558			
Turn Type	NA	pm+ov	Perm	NA	NA			
Protected Phases	2	4 7		6	4 7	4	7	9
Permitted Phases	2	2	6	6				
Detector Phase	2	4 7	6	6	4 7			
Switch Phase								
Minimum Initial (s)	7.0		7.0	7.0		7.0	7.0	5.0
Minimum Split (s)	22.0		22.0	22.0		11.0	11.0	20.0
Total Split (s)	37.0		37.0	37.0		11.0	22.0	20.0
Total Split (%)	41.1%		41.1%	41.1%		12%	24%	22%
Yellow Time (s)	3.0		3.0	3.0		3.0	3.0	2.0
All-Red Time (s)	1.0		1.0	1.0		1.0	1.0	0.0
Lost Time Adjust (s)	0.0		0.0					
Total Lost Time (s)	4.0		4.0					
Lead/Lag					Lag	Lead		
Lead-Lag Optimize?					Yes	Yes		
Recall Mode	Min		Min	Min		None	None	None
v/c Ratio	0.93	0.53		1.05dl	0.91			
Control Delay	42.6	1.7		19.8	43.5			
Queue Delay	0.0	0.5		0.0	0.0			
Total Delay	42.6	2.2		19.8	43.5			
Queue Length 50th (ft)	262	0		67	216			
Queue Length 95th (ft)	#688	26		165	#538			
Internal Link Dist (ft)	440			812	7			
Turn Bay Length (ft)								
Base Capacity (vph)	755	1388		804	616			
Starvation Cap Reductn	0	0		0	0			
Spillback Cap Reductn	0	263		0	0			
Storage Cap Reductn	0	0		0	0			
Reduced v/c Ratio	0.93	0.65		0.56	0.91			

## Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 74

Natural Cycle: 110

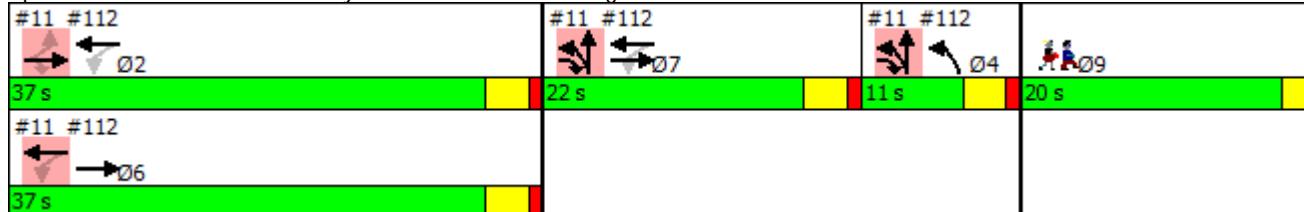
Control Type: Actuated-Uncoordinated

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 11: Wellesley Ave/Town Hall &amp; Washington St



HCM Signalized Intersection Capacity Analysis  
11: Wellesley Ave/Town Hall & Washington St

Synchro 9 Report  
06/03/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	663	692	85	312	0	440	0	51	0	0	0
Future Volume (vph)	0	663	692	85	312	0	440	0	51	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0			4.0				
Lane Util. Factor	1.00	1.00		0.95			1.00					
Frpb, ped/bikes	1.00	1.00		1.00			1.00					
Flpb, ped/bikes	1.00	1.00		1.00			1.00					
Frt	1.00	0.85		1.00			0.99					
Flt Protected	1.00	1.00		0.99			0.96					
Satd. Flow (prot)	1676	1425		3087			1558					
Flt Permitted	1.00	1.00		0.57			0.96					
Satd. Flow (perm)	1676	1425		1783			1558					
Peak-hour factor, PHF	0.94	0.94	0.94	0.89	0.89	0.89	0.88	0.88	0.88	0.92	0.92	0.92
Adj. Flow (vph)	0	705	736	96	351	0	500	0	58	0	0	0
RTOR Reduction (vph)	0	0	127	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	705	609	0	447	0	0	558	0	0	0	0
Confl. Peds. (#/hr)	1				1							
Heavy Vehicles (%)	0%	2%	2%	1%	5%	0%	4%	0%	0%	0%	0%	0%
Turn Type	NA	pm+ov	Perm	NA		Split	NA					
Protected Phases	2	4	7		6		4	7	4	7		
Permitted Phases	2	2	2	6	6							
Actuated Green, G (s)	33.3	62.6		33.3			29.3					
Effective Green, g (s)	33.3	62.6		33.3			29.3					
Actuated g/C Ratio	0.44	0.83		0.44			0.39					
Clearance Time (s)	4.0			4.0								
Vehicle Extension (s)	3.0			3.0								
Lane Grp Cap (vph)	738	1255		785			603					
v/s Ratio Prot	c0.42	0.19					c0.36					
v/s Ratio Perm		0.24		0.25								
v/c Ratio	0.96	0.49		1.05dl			0.93					
Uniform Delay, d1	20.4	1.9		15.8			22.1					
Progression Factor	1.00	1.00		1.00			1.06					
Incremental Delay, d2	22.6	0.3		1.0			19.1					
Delay (s)	43.0	2.2		16.7			42.4					
Level of Service	D	A		B			D					
Approach Delay (s)	22.2			16.7			42.4			0.0		
Approach LOS	C			B			D			A		

Intersection Summary

HCM 2000 Control Delay	25.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	75.6	Sum of lost time (s)	14.0
Intersection Capacity Utilization	91.6%	ICU Level of Service	F
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

## Timings

## Synchro 9 Report

10: Washington St &amp; Grove St &amp; Central St

05/29/2019



Lane Group	EBL	EBT	WBL2	WBL	WBT	NBL2	NBL	NBT	SBL	SBT	NER	Ø9
Lane Configurations												
Traffic Volume (vph)	1	411	5	332	487	11	127	16	33	9	233	
Future Volume (vph)	1	411	5	332	487	11	127	16	33	9	233	
Lane Group Flow (vph)	0	593	0	375	572	0	0	232	0	74	256	
Turn Type	Perm	NA	custom	Prot	NA	Perm	Perm	NA	Perm	NA	Over	
Protected Phases		2		1	6			8		4	1	9
Permitted Phases	2		1			8	8		4			
Detector Phase	2	2	1	1	6	8	8	8	4	4	1	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	6.0	6.0	6.0	6.0	6.0	7.0	1.0
Minimum Split (s)	12.0	12.0	20.0	20.0	12.0	11.0	11.0	11.0	11.0	11.0	20.0	32.0
Total Split (s)	30.0	30.0	32.0	32.0	62.0	18.0	18.0	18.0	18.0	18.0	32.0	32.0
Total Split (%)	26.8%	26.8%	28.6%	28.6%	55.4%	16.1%	16.1%	16.1%	16.1%	16.1%	28.6%	29%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lost Time Adjust (s)								0.0		0.0	0.0	
Total Lost Time (s)					5.0	5.0	5.0		5.0	5.0	5.0	
Lead/Lag	Lag	Lag	Lead	Lead								Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								Yes
Recall Mode	Min	Min	None	None	Min	None	None	None	None	None	None	None
v/c Ratio		0.76		5.21	0.54			1.26		0.41	0.33	
Control Delay	40.5		1945.3	10.2			190.6		48.8	29.9		
Queue Delay		0.0		0.0	0.3		0.0		0.0	0.0	0.0	
Total Delay	40.5		1945.3	10.5			190.6		48.8	29.9		
Queue Length 50th (ft)	132		~358	99			~136		33	52		
Queue Length 95th (ft)	#326		#716	423			#373		93	132		
Internal Link Dist (ft)	525			238			205		238			
Turn Bay Length (ft)											100	
Base Capacity (vph)	811		72	1072			184		182	773		
Starvation Cap Reductn	0		0	130			0		0	0		
Spillback Cap Reductn	0		0	0			0		0	0		
Storage Cap Reductn	0		0	0			0		0	0		
Reduced v/c Ratio	0.73		5.21	0.61			1.26		0.41	0.33		

## Intersection Summary

Cycle Length: 112

Actuated Cycle Length: 92

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 10: Washington St &amp; Grove St &amp; Central St



HCM Signalized Intersection Capacity Analysis  
10: Washington St & Grove St & Central St

Synchro 9 Report  
05/29/2019

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR
Lane Configurations												
Traffic Volume (vph)	1	411	111	29	5	332	487	28	11	127	16	45
Future Volume (vph)	1	411	111	29	5	332	487	28	11	127	16	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	-4%						0%				0%	
Total Lost time (s)	5.0					5.0	5.0				5.0	
Lane Util. Factor	0.95					1.00	1.00				1.00	
Frpb, ped/bikes	0.96					1.00	1.00				0.99	
Flpb, ped/bikes	1.00					0.98	1.00				0.99	
Fr <sub>t</sub>	0.96					1.00	0.99				0.97	
Flt Protected	1.00					0.95	1.00				0.97	
Satd. Flow (prot)	3045					1578	1678				1563	
Flt Permitted	0.95					0.14	1.00				0.79	
Satd. Flow (perm)	2906					239	1678				1270	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.90	0.90	0.90	0.90	0.86	0.86	0.86	0.86
Adj. Flow (vph)	1	442	119	31	6	369	541	31	13	148	19	52
RTOR Reduction (vph)	0	4	0	0	0	0	2	0	0	0	0	0
Lane Group Flow (vph)	0	589	0	0	0	375	570	0	0	0	232	0
Confl. Peds. (#/hr)	8		33	33	33	33		8		9		11
Confl. Bikes (#/hr)												
Heavy Vehicles (%)	0%	1%	1%	0%	25%	0%	1%	0%	0%	1%	0%	0%
Turn Type	Perm	NA		custom		Prot	NA		Perm	Perm	NA	
Protected Phases		2					1	6			8	
Permitted Phases	2				1				8	8		
Actuated Green, G (s)	25.0					27.8	57.8				13.4	
Effective Green, g (s)	25.0					27.8	57.8				13.4	
Actuated g/C Ratio	0.26					0.29	0.61				0.14	
Clearance Time (s)	5.0					5.0	5.0				5.0	
Vehicle Extension (s)	3.0					3.0	3.0				3.0	
Lane Grp Cap (vph)	769					70	1027				180	
v/s Ratio Prot							0.34					
v/s Ratio Perm	c0.20					c1.57					c0.18	
v/c Ratio	0.77					5.36	0.56				1.29	
Uniform Delay, d1	32.0					33.3	10.8				40.5	
Progression Factor	1.00					0.88	0.61				1.00	
Incremental Delay, d2	4.6					1989.4	0.6				165.1	
Delay (s)	36.6					2018.8	7.1				205.6	
Level of Service	D					F	A				F	
Approach Delay (s)	36.6						803.7				205.6	
Approach LOS	D						F				F	

Intersection Summary

HCM 2000 Control Delay 399.7 HCM 2000 Level of Service F

HCM 2000 Volume to Capacity ratio 2.45

Actuated Cycle Length (s) 94.4 Sum of lost time (s) 19.0

Intersection Capacity Utilization 93.1% ICU Level of Service F

Analysis Period (min) 15

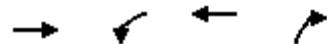
c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
10: Washington St & Grove St & Central St

Synchro 9 Report  
05/29/2019



Movement	SBL	SBT	SBR	SBR2	NER
Lane Configurations					
Traffic Volume (vph)	33	9	15	5	233
Future Volume (vph)	33	9	15	5	233
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Grade (%)	-2%				
Total Lost time (s)	5.0				5.0
Lane Util. Factor	1.00				0.88
Frpb, ped/bikes	0.97				1.00
Flpb, ped/bikes	0.99				1.00
Fr <sub>t</sub>	0.96				0.85
Flt Protected	0.97				1.00
Satd. Flow (prot)	1525				2558
Flt Permitted	0.81				1.00
Satd. Flow (perm)	1264				2558
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.91
Adj. Flow (vph)	39	11	18	6	256
RTOR Reduction (vph)	0	0	0	0	0
Lane Group Flow (vph)	0	74	0	0	256
Confl. Peds. (#/hr)	11		33	9	11
Confl. Bikes (#/hr)					1
Heavy Vehicles (%)	3%	0%	0%	0%	0%
Turn Type	Perm	NA			Over
Protected Phases		4			1
Permitted Phases		4			
Actuated Green, G (s)	13.4				27.8
Effective Green, g (s)	13.4				27.8
Actuated g/C Ratio	0.14				0.29
Clearance Time (s)	5.0				5.0
Vehicle Extension (s)	3.0				3.0
Lane Grp Cap (vph)	179				753
v/s Ratio Prot					0.10
v/s Ratio Perm	0.06				
v/c Ratio	0.41				0.34
Uniform Delay, d1	36.9				26.1
Progression Factor	1.00				1.00
Incremental Delay, d2	1.6				0.3
Delay (s)	38.5				26.4
Level of Service	D				C
Approach Delay (s)	38.5				
Approach LOS	D				
Intersection Summary					



Lane Group	EBT	WBL	WBT	NBR	Ø1	Ø2	Ø4	Ø6	Ø9
Lane Configurations									
Traffic Volume (vph)	687	44	852	94					
Future Volume (vph)	687	44	852	94					
Lane Group Flow (vph)	744	0	974	127					
Turn Type	NA	custom	NA	Over					
Protected Phases	2 1	8	6 8	8	1	2	4	6	9
Permitted Phases					6	8			
Detector Phase	2 1	8	6 8	8					
Switch Phase									
Minimum Initial (s)		6.0		6.0	7.0	7.0	6.0	7.0	1.0
Minimum Split (s)		11.0		11.0	20.0	12.0	11.0	12.0	32.0
Total Split (s)		18.0		18.0	32.0	30.0	18.0	62.0	32.0
Total Split (%)		16.1%		16.1%	29%	27%	16%	55%	29%
Yellow Time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)		1.0		1.0	1.0	1.0	1.0	1.0	0.0
Lost Time Adjust (s)					0.0				
Total Lost Time (s)					5.0				
Lead/Lag					Lead	Lag			
Lead-Lag Optimize?					Yes	Yes			
Recall Mode		None		None	None	Min	None	Min	None
v/c Ratio	0.37		0.43	0.21					
Control Delay	6.2		5.9	0.8					
Queue Delay	0.3		0.0	0.0					
Total Delay	6.5		5.9	0.8					
Queue Length 50th (ft)	28		0	0					
Queue Length 95th (ft)	m97		200	0					
Internal Link Dist (ft)	238		106						
Turn Bay Length (ft)									
Base Capacity (vph)	2036		2291	618					
Starvation Cap Reductn	678		0	0					
Spillback Cap Reductn	0		49	0					
Storage Cap Reductn	0		0	0					
Reduced v/c Ratio	0.55		0.43	0.21					

#### Intersection Summary

Cycle Length: 112

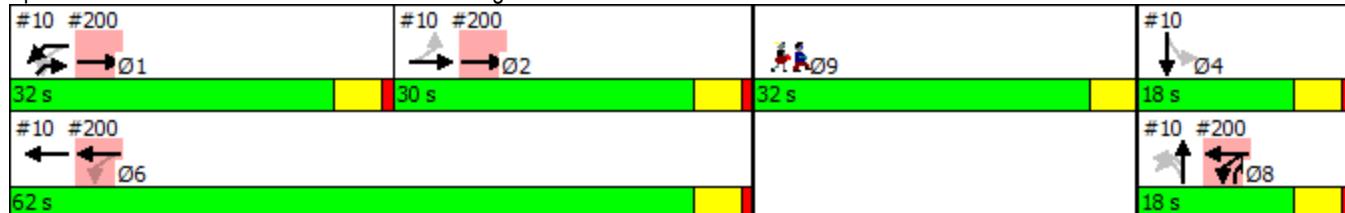
Actuated Cycle Length: 92

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 200: Cameron St & Washington St



HCM Signalized Intersection Capacity Analysis  
200: Cameron St & Washington St

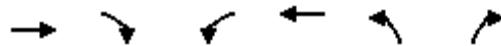
Synchro 9 Report  
05/29/2019



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	687	35	44	852	0	94
Future Volume (vph)	687	35	44	852	0	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0		5.0
Lane Util. Factor	0.95			0.95		1.00
Frpb, ped/bikes	1.00			1.00		1.00
Flpb, ped/bikes	1.00			1.00		1.00
Fr <sub>t</sub>	0.99			1.00		0.86
Flt Protected	1.00			1.00		1.00
Satd. Flow (prot)	3187			3209		1450
Flt Permitted	1.00			0.89		1.00
Satd. Flow (perm)	3187			2858		1450
Peak-hour factor, PHF	0.97	0.97	0.92	0.92	0.74	0.74
Adj. Flow (vph)	708	36	48	926	0	127
RTOR Reduction (vph)	3	0	0	0	0	109
Lane Group Flow (vph)	741	0	0	974	0	18
Confl. Peds. (#/hr)		35	35		41	
Confl. Bikes (#/hr)		4				
Heavy Vehicles (%)	1%	0%	0%	1%	0%	2%
Turn Type	NA	custom	NA		Over	
Protected Phases	2 1		8	6 8		8
Permitted Phases			6			8
Actuated Green, G (s)	57.8			71.2		13.4
Effective Green, g (s)	57.8			71.2		13.4
Actuated g/C Ratio	0.61			0.75		0.14
Clearance Time (s)					5.0	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)	1951			2205		205
v/s Ratio Prot	0.23		c0.06		0.01	
v/s Ratio Perm			c0.27			
v/c Ratio	0.38		0.44		0.09	
Uniform Delay, d1	9.2		4.3		35.2	
Progression Factor	0.52		1.00		1.00	
Incremental Delay, d2	0.1		0.1		0.2	
Delay (s)	4.9		4.4		35.4	
Level of Service	A		A		D	
Approach Delay (s)	4.9		4.4	35.4		
Approach LOS	A		A	D		
<b>Intersection Summary</b>						
HCM 2000 Control Delay	6.7		HCM 2000 Level of Service		A	
HCM 2000 Volume to Capacity ratio	0.42					
Actuated Cycle Length (s)	94.4		Sum of lost time (s)		19.0	
Intersection Capacity Utilization	58.4%		ICU Level of Service		B	
Analysis Period (min)	15					
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis  
210: Library Lot & Washington St

Synchro 9 Report  
05/29/2019



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	760	24	30	897	0	49
Future Volume (Veh/h)	760	24	30	897	0	49
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.92	0.92	0.73	0.73
Hourly flow rate (vph)	835	26	33	975	0	67
Pedestrians	2			1	26	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	2	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	186			520		
pX, platoon unblocked			0.89		0.92	0.89
vC, conflicting volume			887		1430	458
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			626		986	143
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		100	91
cM capacity (veh/h)			841		215	770
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	557	304	358	650	67	
Volume Left	0	0	33	0	0	
Volume Right	0	26	0	0	67	
cSH	1700	1700	841	1700	770	
Volume to Capacity	0.33	0.18	0.04	0.38	0.09	
Queue Length 95th (ft)	0	0	3	0	7	
Control Delay (s)	0.0	0.0	1.3	0.0	10.1	
Lane LOS			A		B	
Approach Delay (s)	0.0		0.5		10.1	
Approach LOS					B	
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			56.9%	ICU Level of Service		B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
220: Grove St & Spring St

Synchro 9 Report  
05/29/2019



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (veh/h)	80	74	124	19	11	120
Future Volume (Veh/h)	80	74	124	19	11	120
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.65	0.65	0.79	0.79	0.94	0.94
Hourly flow rate (vph)	123	114	157	24	12	128
Pedestrians	10		3			12
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	1		0			1
Right turn flare (veh)						
Median type		None			None	
Median storage veh						
Upstream signal (ft)					285	
pX, platoon unblocked						
vC, conflicting volume	334	191		191		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	334	191		191		
tC, single (s)	6.4	6.2		4.1		
tC, 2 stage (s)						
tF (s)	3.5	3.3		2.2		
p0 queue free %	81	86		99		
cM capacity (veh/h)	646	838		1383		
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	237	181	140			
Volume Left	123	0	12			
Volume Right	114	24	0			
cSH	726	1700	1383			
Volume to Capacity	0.33	0.11	0.01			
Queue Length 95th (ft)	36	0	1			
Control Delay (s)	12.3	0.0	0.7			
Lane LOS	B		A			
Approach Delay (s)	12.3	0.0	0.7			
Approach LOS	B					
Intersection Summary						
Average Delay		5.4				
Intersection Capacity Utilization		32.9%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
230: Grove St & Hampden St

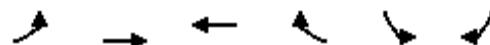
Synchro 9 Report  
05/29/2019



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	122	39	99	82	21	165
Future Volume (Veh/h)	122	39	99	82	21	165
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.75	0.75	0.92	0.92	0.75	0.75
Hourly flow rate (vph)	163	52	108	89	28	220
Pedestrians	2					13
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	0					1
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	430	168			199	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	430	168			199	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	72	94			98	
cM capacity (veh/h)	573	863			1383	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	215	197	248			
Volume Left	163	0	28			
Volume Right	52	89	0			
cSH	623	1700	1383			
Volume to Capacity	0.34	0.12	0.02			
Queue Length 95th (ft)	38	0	2			
Control Delay (s)	13.8	0.0	1.0			
Lane LOS	B		A			
Approach Delay (s)	13.8	0.0	1.0			
Approach LOS	B					
Intersection Summary						
Average Delay		4.9				
Intersection Capacity Utilization		41.2%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
240: Hampden St & Cameron St

Synchro 9 Report  
05/29/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	49	49	138	54	2	7
Future Volume (Veh/h)	49	49	138	54	2	7
Sign Control	Free	Free		Stop		
Grade	0%	0%		0%		
Peak Hour Factor	0.67	0.67	0.88	0.88	0.56	0.56
Hourly flow rate (vph)	73	73	157	61	4	13
Pedestrians	1	15		5		
Lane Width (ft)	12.0	12.0		12.0		
Walking Speed (ft/s)	4.0	4.0		4.0		
Percent Blockage	0	1		0		
Right turn flare (veh)						
Median type	None	None				
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	223			426	194	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	223			426	194	
tC, single (s)	4.1			6.4	6.3	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.4	
p0 queue free %	95			99	98	
cM capacity (veh/h)	1340			547	814	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	146	218	17			
Volume Left	73	0	4			
Volume Right	0	61	13			
cSH	1340	1700	730			
Volume to Capacity	0.05	0.13	0.02			
Queue Length 95th (ft)	4	0	2			
Control Delay (s)	4.1	0.0	10.0			
Lane LOS	A		B			
Approach Delay (s)	4.1	0.0	10.0			
Approach LOS			B			
Intersection Summary						
Average Delay		2.0				
Intersection Capacity Utilization		30.1%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
250: Brook St & Hampden St

Synchro 9 Report  
05/29/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	17	33	129	25	50	54
Future Volume (Veh/h)	17	33	129	25	50	54
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.69	0.69	0.88	0.88	0.92	0.92
Hourly flow rate (vph)	25	48	147	28	54	59
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (ft)				1034		
pX, platoon unblocked						
vC, conflicting volume	406	84	113			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	406	84	113			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	95	90			
cM capacity (veh/h)	546	981	1489			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	73	175	113			
Volume Left	25	147	0			
Volume Right	48	0	59			
cSH	771	1489	1700			
Volume to Capacity	0.09	0.10	0.07			
Queue Length 95th (ft)	8	8	0			
Control Delay (s)	10.2	6.6	0.0			
Lane LOS	B	A				
Approach Delay (s)	10.2	6.6	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay		5.2				
Intersection Capacity Utilization		25.1%		ICU Level of Service		A
Analysis Period (min)		15				

## Queues

11: Wellesley Ave/Town Hall &amp; Washington St

Synchro 9 Report

06/03/2019



Lane Group	EBT	EBC	WBL	WBT	NBT	Ø4	Ø7	Ø9
Lane Configurations	4	1		4 1	4			
Traffic Volume (vph)	374	421	127	490	0			
Future Volume (vph)	374	421	127	490	0			
Lane Group Flow (vph)	386	434	0	671	540			
Turn Type	NA	pm+ov	pm+pt	NA	NA			
Protected Phases	2	4 7	1	6	4 7	4	7	9
Permitted Phases	2	2	6	6 1				
Detector Phase	2	4 7	1	6	4 7			
Switch Phase								
Minimum Initial (s)	7.0		6.0	7.0		7.0	7.0	5.0
Minimum Split (s)	11.0		10.0	11.0		11.0	11.0	20.0
Total Split (s)	33.0		10.0	43.0		26.0	11.0	20.0
Total Split (%)	33.0%		10.0%	43.0%		26%	11%	20%
Yellow Time (s)	3.0		3.0	3.0		3.0	3.0	2.0
All-Red Time (s)	1.0		1.0	1.0		1.0	1.0	0.0
Lost Time Adjust (s)	0.0		0.0					
Total Lost Time (s)	4.0		4.0					
Lead/Lag	Lag		Lead			Lag	Lead	
Lead-Lag Optimize?	Yes		Yes			Yes	Yes	
Recall Mode	Min		None	Min		None	None	None
v/c Ratio	0.73	0.36		0.71	0.82			
Control Delay	34.7	1.4		23.3	44.3			
Queue Delay	0.0	0.4		0.0	0.0			
Total Delay	34.7	1.8		23.3	44.3			
Queue Length 50th (ft)	156	0		108	296			
Queue Length 95th (ft)	#369	31		#233	#600			
Internal Link Dist (ft)	440			812	7			
Turn Bay Length (ft)								
Base Capacity (vph)	622	1209		1043	656			
Starvation Cap Reductn	0	0		0	0			
Spillback Cap Reductn	0	365		0	0			
Storage Cap Reductn	0	0		0	0			
Reduced v/c Ratio	0.62	0.51		0.64	0.82			

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 80.3

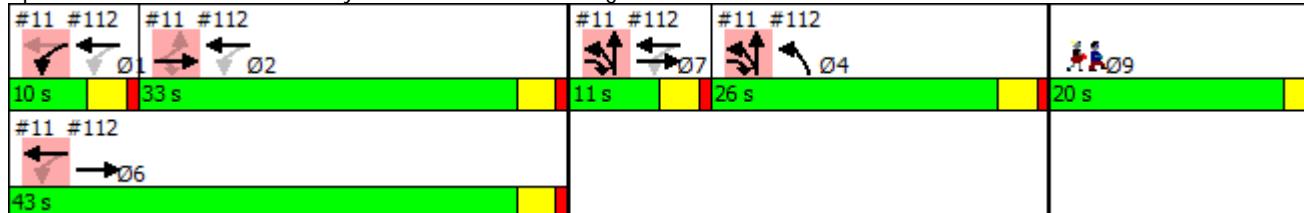
Natural Cycle: 90

Control Type: Actuated-Uncoordinated

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 11: Wellesley Ave/Town Hall &amp; Washington St



HCM Signalized Intersection Capacity Analysis  
11: Wellesley Ave/Town Hall & Washington St

Synchro 9 Report  
06/03/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	374	421	127	490	0	472	0	51	0	0	0
Future Volume (vph)	0	374	421	127	490	0	472	0	51	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0			4.0				
Lane Util. Factor	1.00	1.00		0.95			1.00					
Frpb, ped/bikes	1.00	1.00		1.00			1.00					
Flpb, ped/bikes	1.00	1.00		1.00			1.00					
Frt	1.00	0.85		1.00			0.99					
Flt Protected	1.00	1.00		0.99			0.96					
Satd. Flow (prot)	1693	1425		3153			1569					
Flt Permitted	1.00	1.00		0.60			0.96					
Satd. Flow (perm)	1693	1425		1920			1569					
Peak-hour factor, PHF	0.97	0.97	0.97	0.92	0.92	0.92	0.97	0.97	0.97	0.92	0.92	0.92
Adj. Flow (vph)	0	386	434	138	533	0	487	0	53	0	0	0
RTOR Reduction (vph)	0	0	122	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	386	312	0	671	0	0	540	0	0	0	0
Confl. Peds. (#/hr)	2				2	2						
Heavy Vehicles (%)	0%	1%	2%	2%	2%	0%	3%	0%	2%	0%	0%	0%
Turn Type	NA	pm+ov	pm+pt	NA			Split	NA				
Protected Phases	2	4	7	1	6		4	7	4	7		
Permitted Phases	2	2	2	6	6	1						
Actuated Green, G (s)	25.2	58.7		35.3			33.5					
Effective Green, g (s)	25.2	58.7		35.3			33.5					
Actuated g/C Ratio	0.31	0.72		0.43			0.41					
Clearance Time (s)	4.0			4.0								
Vehicle Extension (s)	3.0			3.0								
Lane Grp Cap (vph)	522	1093		921			643					
v/s Ratio Prot	0.23	0.12		c0.05			c0.34					
v/s Ratio Perm		0.10		c0.26								
v/c Ratio	0.74	0.29		0.73			0.84					
Uniform Delay, d1	25.3	4.1		19.2			21.7					
Progression Factor	1.00	1.00		1.00			1.45					
Incremental Delay, d2	5.4	0.1		2.9			8.8					
Delay (s)	30.8	4.2		22.1			40.2					
Level of Service	C	A		C			D					
Approach Delay (s)	16.7			22.1			40.2			0.0		
Approach LOS	B			C			D			A		
<b>Intersection Summary</b>												
HCM 2000 Control Delay	24.8			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.84											
Actuated Cycle Length (s)	81.7			Sum of lost time (s)			18.0					
Intersection Capacity Utilization	83.5%			ICU Level of Service			E					
Analysis Period (min)	15											
c Critical Lane Group												

## Timings

Synchro 9 Report

10: Washington St &amp; Grove St &amp; Central St

05/29/2019



Lane Group	EBT	WBL2	WBL	WBT	NBL2	NBL	NBT	SBL	SBT	NER	Ø9
Lane Configurations											
Traffic Volume (vph)	752	9	194	473	6	143	22	41	21	494	
Future Volume (vph)	752	9	194	473	6	143	22	41	21	494	
Lane Group Flow (vph)	952	0	221	554	0	0	265	0	91	562	
Turn Type	NA	custom	Prot	NA	Perm	Perm	NA	Perm	NA	Over	
Protected Phases	2		1	6			8		4	1	9
Permitted Phases			1		8	8		4			
Detector Phase	2	1	1	6	8	8	8	4	4	1	
Switch Phase											
Minimum Initial (s)	7.0	7.0	7.0	7.0	6.0	6.0	6.0	6.0	6.0	7.0	1.0
Minimum Split (s)	12.0	12.0	12.0	12.0	11.0	11.0	11.0	11.0	11.0	12.0	32.0
Total Split (s)	42.0	36.0	36.0	78.0	30.0	30.0	30.0	30.0	30.0	36.0	32.0
Total Split (%)	30.0%	25.7%	25.7%	55.7%	21.4%	21.4%	21.4%	21.4%	21.4%	25.7%	23%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lost Time Adjust (s)	0.0		0.0			0.0			0.0		0.0
Total Lost Time (s)	5.0		5.0			5.0			5.0		5.0
Lead/Lag	Lag	Lead	Lead							Lead	
Lead-Lag Optimize?	Yes	Yes	Yes							Yes	
Recall Mode	Min	None	None	Min	None	None	None	None	None	None	None
v/c Ratio	0.96		4.17	0.54			1.06		0.36	0.78	
Control Delay	62.7		1467.1	15.4			119.1		49.4	45.5	
Queue Delay	0.0		0.0	0.6			17.3		0.5	3.2	
Total Delay	62.7		1467.1	16.0			136.4		50.0	48.7	
Queue Length 50th (ft)	322		~279	142			182		53	169	
Queue Length 95th (ft)	#631		#549	480			#443		108	#348	
Internal Link Dist (ft)	525			238			205		238		
Turn Bay Length (ft)										100	
Base Capacity (vph)	989		53	1018			251		256	716	
Starvation Cap Reductn	0		0	174			0		0	0	
Spillback Cap Reductn	0		0	0			34		35	81	
Storage Cap Reductn	0		0	0			0		0	0	
Reduced v/c Ratio	0.96		4.17	0.66			1.22		0.41	0.89	

## Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 120.8

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

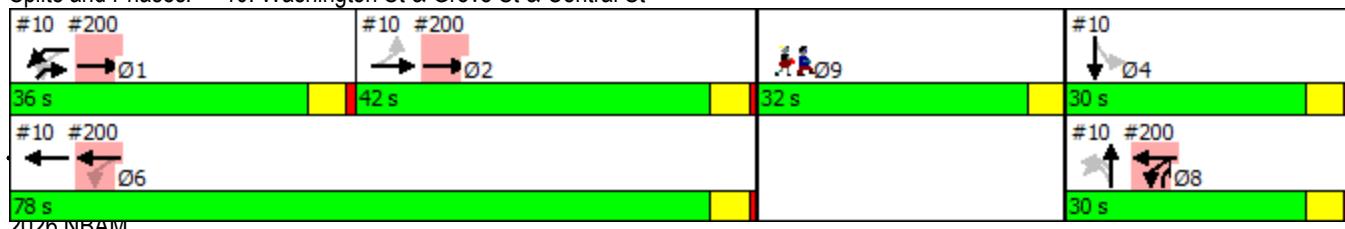
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 10: Washington St &amp; Grove St &amp; Central St

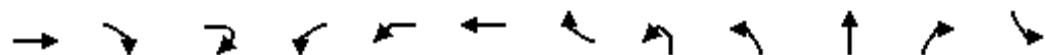


## HCM Signalized Intersection Capacity Analysis

Synchro 9 Report

10: Washington St &amp; Grove St &amp; Central St

05/29/2019



Movement	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	752	69	8	9	194	473	37	6	143	22	54	41
Future Volume (vph)	752	69	8	9	194	473	37	6	143	22	54	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	-4%					0%				0%		
Total Lost time (s)	5.0				5.0	5.0				5.0		
Lane Util. Factor	0.95					1.00	1.00			1.00		
Frpb, ped/bikes	1.00					1.00	1.00			0.99		
Flpb, ped/bikes	1.00					1.00	1.00			0.99		
Fr <sub>t</sub>	0.99					1.00	0.99			0.97		
Flt Protected	1.00					0.95	1.00			0.97		
Satd. Flow (prot)	3180					1539	1657			1544		
Flt Permitted	1.00					0.13	1.00			0.75		
Satd. Flow (perm)	3180					206	1657			1200		
Peak-hour factor, PHF	0.87	0.87	0.87	0.92	0.92	0.92	0.92	0.85	0.85	0.85	0.85	0.75
Adj. Flow (vph)	864	79	9	10	211	514	40	7	168	26	64	55
RTOR Reduction (vph)	1	0	0	0	0	2	0	0	0	0	0	0
Lane Group Flow (vph)	951	0	0	0	221	552	0	0	0	265	0	0
Confl. Peds. (#/hr)	5	5	5	5			16		16		11	11
Confl. Bikes (#/hr)	5	5				2						
Heavy Vehicles (%)	2%	6%	0%	33%	4%	2%	0%	0%	2%	0%	2%	3%
Turn Type	NA		custom		Prot	NA		Perm	Perm	NA		Perm
Protected Phases	2					1	6				8	
Permitted Phases				1				8	8			4
Actuated Green, G (s)	37.7				31.5	74.2				25.4		
Effective Green, g (s)	37.7				31.5	74.2				25.4		
Actuated g/C Ratio	0.31				0.26	0.60				0.21		
Clearance Time (s)	5.0				5.0	5.0				5.0		
Vehicle Extension (s)	3.0				3.0	3.0				3.0		
Lane Grp Cap (vph)	972				52	997				247		
v/s Ratio Prot	c0.30					0.33						
v/s Ratio Perm					c1.07					c0.22		
v/c Ratio	0.98				4.25	0.55				1.07		
Uniform Delay, d1	42.4				45.9	14.7				49.0		
Progression Factor	1.00				0.95	0.79				1.00		
Incremental Delay, d2	23.5				1504.6	0.6				77.9		
Delay (s)	65.9				1548.0	12.3				126.9		
Level of Service	E				F	B				F		
Approach Delay (s)	65.9					450.2				126.9		
Approach LOS	E					F				F		

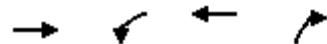
## Intersection Summary

HCM 2000 Control Delay	180.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.88		
Actuated Cycle Length (s)	123.3	Sum of lost time (s)	19.0
Intersection Capacity Utilization	111.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR	SBR2	NER	NER2
Lane Configurations					
Traffic Volume (vph)	21	5	1	494	1
Future Volume (vph)	21	5	1	494	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Grade (%)	-2%				
Total Lost time (s)	5.0			5.0	
Lane Util. Factor	1.00			0.88	
Frpb, ped/bikes	1.00			1.00	
Flpb, ped/bikes	1.00			1.00	
Fr <sub>t</sub>	0.99			0.85	
Flt Protected	0.97			1.00	
Satd. Flow (prot)	1590			2504	
Flt Permitted	0.75			1.00	
Satd. Flow (perm)	1223			2504	
Peak-hour factor, PHF	0.75	0.75	0.75	0.88	0.88
Adj. Flow (vph)	28	7	1	561	1
RTOR Reduction (vph)	0	0	0	64	0
Lane Group Flow (vph)	91	0	0	498	0
Confl. Peds. (#/hr)		5	16	11	
Confl. Bikes (#/hr)					
Heavy Vehicles (%)	5%	0%	0%	2%	100%
Turn Type	NA			Over	
Protected Phases	4			1	
Permitted Phases					
Actuated Green, G (s)	25.4			31.5	
Effective Green, g (s)	25.4			31.5	
Actuated g/C Ratio	0.21			0.26	
Clearance Time (s)	5.0			5.0	
Vehicle Extension (s)	3.0			3.0	
Lane Grp Cap (vph)	251			639	
v/s Ratio Prot			0.20		
v/s Ratio Perm	0.07				
v/c Ratio	0.36		0.78		
Uniform Delay, d1	42.0		42.7		
Progression Factor	1.00			1.00	
Incremental Delay, d2	0.9			6.0	
Delay (s)	42.9		48.7		
Level of Service	D			D	
Approach Delay (s)	42.9				
Approach LOS	D				
Intersection Summary					



Lane Group	EBT	WBL	WBT	NBR	Ø1	Ø2	Ø4	Ø6	Ø9
Lane Configurations	↑↓	↑↓	↑↓	↑					
Traffic Volume (vph)	1316	29	713	79					
Future Volume (vph)	1316	29	713	79					
Lane Group Flow (vph)	1541	0	798	149					
Turn Type	NA	custom	NA	Over					
Protected Phases	2 1	8	6 8	8	1	2	4	6	9
Permitted Phases					6	8			
Detector Phase	2 1	8	6 8	8					
Switch Phase									
Minimum Initial (s)		6.0		6.0	7.0	7.0	6.0	7.0	1.0
Minimum Split (s)		11.0		11.0	12.0	12.0	11.0	12.0	32.0
Total Split (s)		30.0		30.0	36.0	42.0	30.0	78.0	32.0
Total Split (%)		21.4%		21.4%	26%	30%	21%	56%	23%
Yellow Time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)		1.0		1.0	1.0	1.0	1.0	1.0	0.0
Lost Time Adjust (s)					0.0				
Total Lost Time (s)					5.0				
Lead/Lag					Lead	Lag			
Lead-Lag Optimize?					Yes	Yes			
Recall Mode		None		None	None	Min	None	Min	None
v/c Ratio	0.78		0.34	0.26					
Control Delay	11.9		3.8	1.1					
Queue Delay	3.2		0.0	0.0					
Total Delay	15.1		3.9	1.1					
Queue Length 50th (ft)	84		0	0					
Queue Length 95th (ft)	m318		148	0					
Internal Link Dist (ft)	238		106						
Turn Bay Length (ft)									
Base Capacity (vph)	1969		2360	570					
Starvation Cap Reductn	322		0	0					
Spillback Cap Reductn	0		90	0					
Storage Cap Reductn	0		0	0					
Reduced v/c Ratio	0.94		0.35	0.26					

#### Intersection Summary

Cycle Length: 140

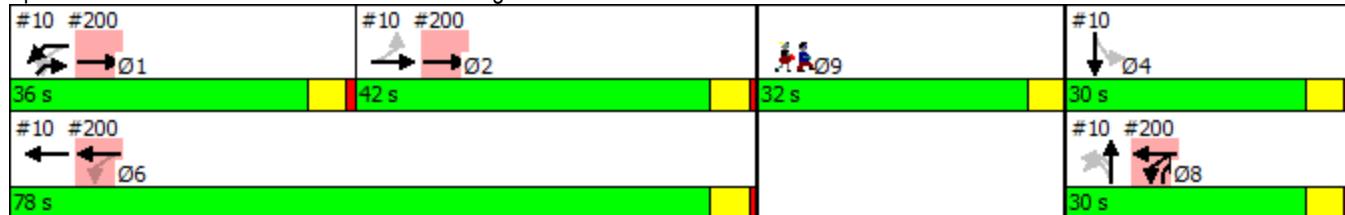
Actuated Cycle Length: 120.8

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 200: Cameron St & Washington St



HCM Signalized Intersection Capacity Analysis  
200: Cameron St & Washington St

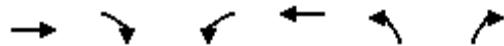
Synchro 9 Report  
05/29/2019



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1316	24	29	713	0	79
Future Volume (vph)	1316	24	29	713	0	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0		5.0
Lane Util. Factor	0.95			0.95		1.00
Frpb, ped/bikes	1.00			1.00		1.00
Flpb, ped/bikes	1.00			1.00		1.00
Fr <sub>t</sub>	1.00			1.00		0.86
Flt Protected	1.00			1.00		1.00
Satd. Flow (prot)	3207			3212		1465
Flt Permitted	1.00			0.85		1.00
Satd. Flow (perm)	3207			2746		1465
Peak-hour factor, PHF	0.87	0.87	0.93	0.93	0.53	0.53
Adj. Flow (vph)	1513	28	31	767	0	149
RTOR Reduction (vph)	1	0	0	0	0	118
Lane Group Flow (vph)	1540	0	0	798	0	31
Confl. Peds. (#/hr)	14	14		18	2	
Confl. Bikes (#/hr)	5				1	
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Turn Type	NA	custom	NA		Over	
Protected Phases	2 1		8	6 8		8
Permitted Phases			6			8
Actuated Green, G (s)	74.2			99.6		25.4
Effective Green, g (s)	74.2			99.6		25.4
Actuated g/C Ratio	0.60			0.81		0.21
Clearance Time (s)					5.0	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)	1929			2314		301
v/s Ratio Prot	c0.48			c0.07		0.02
v/s Ratio Perm			0.21			
v/c Ratio	0.80			0.34		0.10
Uniform Delay, d1	18.8			3.2		39.7
Progression Factor	0.48			1.00		1.00
Incremental Delay, d2	1.0			0.1		0.1
Delay (s)	10.0			3.2		39.8
Level of Service	B			A		D
Approach Delay (s)	10.0			3.2	39.8	
Approach LOS	B			A	D	
<b>Intersection Summary</b>						
HCM 2000 Control Delay	9.6			HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio	0.65					
Actuated Cycle Length (s)	123.3			Sum of lost time (s)		19.0
Intersection Capacity Utilization	57.0%			ICU Level of Service		B
Analysis Period (min)	15					
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis  
210: Library Lot & Washington St

Synchro 9 Report  
05/29/2019



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1383	12	12	742	0	14
Future Volume (Veh/h)	1383	12	12	742	0	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.83	0.90	0.90	0.54	0.54
Hourly flow rate (vph)	1666	14	13	824	0	26
Pedestrians	1				9	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	0				1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)	186			520		
pX, platoon unblocked			0.63		0.63	0.63
vC, conflicting volume			1689		2121	849
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			915		1602	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		100	96
cM capacity (veh/h)			470		60	681
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	1111	569	288	549	26	
Volume Left	0	0	13	0	0	
Volume Right	0	14	0	0	26	
cSH	1700	1700	470	1700	681	
Volume to Capacity	0.65	0.33	0.03	0.32	0.04	
Queue Length 95th (ft)	0	0	2	0	3	
Control Delay (s)	0.0	0.0	1.0	0.0	10.5	
Lane LOS			A		B	
Approach Delay (s)	0.0		0.3		10.5	
Approach LOS					B	
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			48.6%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
220: Grove St & Spring St

Synchro 9 Report  
05/29/2019



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	B	T	R	S	BT
Traffic Volume (veh/h)	47	52	173	36	15	88
Future Volume (Veh/h)	47	52	173	36	15	88
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.57	0.57	0.77	0.77	0.67	0.67
Hourly flow rate (vph)	82	91	225	47	22	131
Pedestrians	16		4		13	
Lane Width (ft)	12.0		12.0		12.0	
Walking Speed (ft/s)	4.0		4.0		4.0	
Percent Blockage	1		0		1	
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (ft)					285	
pX, platoon unblocked						
vC, conflicting volume	444	278		288		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	444	278		288		
tC, single (s)	6.4	6.2		4.1		
tC, 2 stage (s)						
tF (s)	3.5	3.3		2.2		
p0 queue free %	85	88		98		
cM capacity (veh/h)	553	738		1268		
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	173	272	153			
Volume Left	82	0	22			
Volume Right	91	47	0			
cSH	637	1700	1268			
Volume to Capacity	0.27	0.16	0.02			
Queue Length 95th (ft)	27	0	1			
Control Delay (s)	12.7	0.0	1.3			
Lane LOS	B		A			
Approach Delay (s)	12.7	0.0	1.3			
Approach LOS	B					
Intersection Summary						
Average Delay		4.0				
Intersection Capacity Utilization		32.9%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
230: Grove St & Hampden St

Synchro 9 Report  
05/29/2019



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (veh/h)	74	36	162	324	44	75
Future Volume (Veh/h)	74	36	162	324	44	75
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.72	0.72	0.85	0.85	0.92	0.92
Hourly flow rate (vph)	103	50	191	381	48	82
Pedestrians	7					12
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	1					1
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	566	400		579		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	566	400		579		
tC, single (s)	6.4	6.2		4.1		
tC, 2 stage (s)						
tF (s)	3.5	3.3		2.2		
p0 queue free %	78	92		95		
cM capacity (veh/h)	462	644		974		
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	153	572	130			
Volume Left	103	0	48			
Volume Right	50	381	0			
cSH	509	1700	974			
Volume to Capacity	0.30	0.34	0.05			
Queue Length 95th (ft)	31	0	4			
Control Delay (s)	15.1	0.0	3.6			
Lane LOS	C		A			
Approach Delay (s)	15.1	0.0	3.6			
Approach LOS	C					
Intersection Summary						
Average Delay		3.2				
Intersection Capacity Utilization		54.2%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
240: Hampden St & Cameron St

Synchro 9 Report  
05/29/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	108	204	174	84	4	13
Future Volume (Veh/h)	108	204	174	84	4	13
Sign Control	Free	Free		Stop		
Grade	0%	0%		0%		
Peak Hour Factor	0.62	0.62	0.68	0.68	0.40	0.40
Hourly flow rate (vph)	174	329	256	124	10	33
Pedestrians		1	16		3	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	1		0	
Right turn flare (veh)						
Median type	None	None				
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	383			1014	322	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	383			1014	322	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	85			96	95	
cM capacity (veh/h)	1167			223	721	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	503	380	43			
Volume Left	174	0	10			
Volume Right	0	124	33			
cSH	1167	1700	475			
Volume to Capacity	0.15	0.22	0.09			
Queue Length 95th (ft)	13	0	7			
Control Delay (s)	4.0	0.0	13.3			
Lane LOS	A		B			
Approach Delay (s)	4.0	0.0	13.3			
Approach LOS			B			
Intersection Summary						
Average Delay		2.8				
Intersection Capacity Utilization		44.8%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
250: Brook St & Hampden St

Synchro 9 Report  
05/29/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	87	120	173	50	47	78
Future Volume (Veh/h)	87	120	173	50	47	78
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.78	0.78	0.67	0.67
Hourly flow rate (vph)	106	146	222	64	70	116
Pedestrians	9					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	1					
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (ft)				1034		
pX, platoon unblocked						
vC, conflicting volume	645	137	195			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	645	137	195			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	71	84	84			
cM capacity (veh/h)	366	910	1374			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	252	286	186			
Volume Left	106	222	0			
Volume Right	146	0	116			
cSH	560	1374	1700			
Volume to Capacity	0.45	0.16	0.11			
Queue Length 95th (ft)	58	14	0			
Control Delay (s)	16.6	6.6	0.0			
Lane LOS	C	A				
Approach Delay (s)	16.6	6.6	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay		8.4				
Intersection Capacity Utilization		43.7%		ICU Level of Service		A
Analysis Period (min)		15				

## Queues

11: Wellesley Ave/Town Hall &amp; Washington St

Synchro 9 Report

06/03/2019



Lane Group	EBT	EBC	WBL	WBT	NBT	Ø4	Ø7	Ø9
Lane Configurations	4	1		4 1	4			
Traffic Volume (vph)	683	712	87	321	0			
Future Volume (vph)	683	712	87	321	0			
Lane Group Flow (vph)	727	757	0	459	575			
Turn Type	NA	pm+ov	Perm	NA	NA			
Protected Phases	2	4 7		6	4 7	4	7	9
Permitted Phases	2	2	6	6				
Detector Phase	2	4 7	6	6	4 7			
Switch Phase								
Minimum Initial (s)	7.0		7.0	7.0		7.0	7.0	5.0
Minimum Split (s)	22.0		22.0	22.0		11.0	11.0	20.0
Total Split (s)	37.0		37.0	37.0		11.0	22.0	20.0
Total Split (%)	41.1%		41.1%	41.1%		12%	24%	22%
Yellow Time (s)	3.0		3.0	3.0		3.0	3.0	2.0
All-Red Time (s)	1.0		1.0	1.0		1.0	1.0	0.0
Lost Time Adjust (s)	0.0			0.0				
Total Lost Time (s)	4.0			4.0				
Lead/Lag					Lag	Lead		
Lead-Lag Optimize?					Yes	Yes		
Recall Mode	Min		Min	Min	None	None	None	
v/c Ratio	0.96	0.54		1.08dl	0.93			
Control Delay	48.0	1.8		20.5	47.7			
Queue Delay	0.0	0.5		0.0	0.0			
Total Delay	48.0	2.4		20.5	47.7			
Queue Length 50th (ft)	277	0		70	226			
Queue Length 95th (ft)	#717	26		173	#559			
Internal Link Dist (ft)	440			812	7			
Turn Bay Length (ft)								
Base Capacity (vph)	755	1389		784	616			
Starvation Cap Reductn	0	4		0	0			
Spillback Cap Reductn	0	269		0	0			
Storage Cap Reductn	0	0		0	0			
Reduced v/c Ratio	0.96	0.68		0.59	0.93			

## Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 74

Natural Cycle: 130

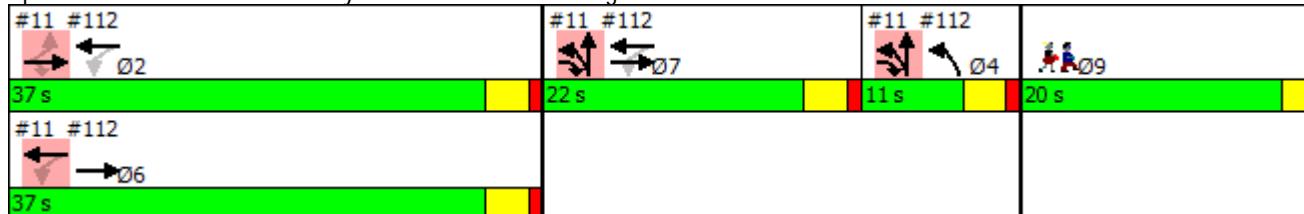
Control Type: Actuated-Uncoordinated

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 11: Wellesley Ave/Town Hall &amp; Washington St



HCM Signalized Intersection Capacity Analysis  
11: Wellesley Ave/Town Hall & Washington St

Synchro 9 Report  
06/03/2019



Movement	EBL	EBT	EBC	WBL	WBT	WBC	NBL	NBT	NBC	SBL	SBT	SBC
Lane Configurations												
Traffic Volume (vph)	0	683	712	87	321	0	453	0	53	0	0	0
Future Volume (vph)	0	683	712	87	321	0	453	0	53	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0			4.0				
Lane Util. Factor	1.00	1.00		0.95			1.00					
Frpb, ped/bikes	1.00	1.00		1.00			1.00					
Flpb, ped/bikes	1.00	1.00		1.00			1.00					
Fr <sub>t</sub>	1.00	0.85		1.00			0.99					
Flt Protected	1.00	1.00		0.99			0.96					
Satd. Flow (prot)	1676	1425		3087			1558					
Flt Permitted	1.00	1.00		0.56			0.96					
Satd. Flow (perm)	1676	1425		1741			1558					
Peak-hour factor, PHF	0.94	0.94	0.94	0.89	0.89	0.89	0.88	0.88	0.88	0.92	0.92	0.92
Adj. Flow (vph)	0	727	757	98	361	0	515	0	60	0	0	0
RTOR Reduction (vph)	0	0	130	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	727	627	0	459	0	0	575	0	0	0	0
Confl. Peds. (#/hr)	1				1							
Heavy Vehicles (%)	0%	2%	2%	1%	5%	0%	4%	0%	0%	0%	0%	0%
Turn Type	NA	pm+ov	Perm	NA		Split	NA					
Protected Phases	2	4	7		6		4	7	4	7		
Permitted Phases	2	2	2	6	6							
Actuated Green, G (s)	33.3	62.6		33.3			29.3					
Effective Green, g (s)	33.3	62.6		33.3			29.3					
Actuated g/C Ratio	0.44	0.83		0.44			0.39					
Clearance Time (s)	4.0			4.0								
Vehicle Extension (s)	3.0			3.0								
Lane Grp Cap (vph)	738	1255		766			603					
v/s Ratio Prot	c0.43	0.19					c0.37					
v/s Ratio Perm		0.25		0.26								
v/c Ratio	0.99	0.50		1.08dl			0.95					
Uniform Delay, d1	20.9	1.9		16.1			22.5					
Progression Factor	1.00	1.00		1.00			1.06					
Incremental Delay, d2	29.2	0.3		1.3			24.1					
Delay (s)	50.1	2.2		17.3			48.0					
Level of Service	D	A		B			D					
Approach Delay (s)	25.7			17.3			48.0			0.0		
Approach LOS	C			B			D			A		

Intersection Summary

HCM 2000 Control Delay	29.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	75.6	Sum of lost time (s)	14.0
Intersection Capacity Utilization	94.1%	ICU Level of Service	F
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

## Timings

Synchro 9 Report

10: Washington St &amp; Grove St &amp; Central St

05/29/2019



Lane Group	EBL	EBT	WBL2	WBL	WBT	NBL2	NBL	NBT	SBL	SBT	NER	Ø9
Lane Configurations												
Traffic Volume (vph)	1	423	5	342	501	11	131	16	34	10	240	
Future Volume (vph)	1	423	5	342	501	11	131	16	34	10	240	
Lane Group Flow (vph)	0	612	0	386	589	0	0	239	0	76	264	
Turn Type	Perm	NA	custom	Prot	NA	Perm	Perm	NA	Perm	NA	Over	
Protected Phases		2			1	6			8		4	1
Permitted Phases	2						8	8		4		9
Detector Phase	2	2	1	1	6	8	8	8	4	4	1	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	6.0	6.0	6.0	6.0	6.0	7.0	1.0
Minimum Split (s)	12.0	12.0	20.0	20.0	12.0	11.0	11.0	11.0	11.0	11.0	20.0	32.0
Total Split (s)	30.0	30.0	32.0	32.0	62.0	18.0	18.0	18.0	18.0	18.0	32.0	32.0
Total Split (%)	26.8%	26.8%	28.6%	28.6%	55.4%	16.1%	16.1%	16.1%	16.1%	16.1%	28.6%	29%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lost Time Adjust (s)									0.0		0.0	0.0
Total Lost Time (s)					5.0	5.0			5.0		5.0	5.0
Lead/Lag	Lag	Lag	Lead	Lead								Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								Yes
Recall Mode	Min	Min	None	None	Min	None	None	None	None	None	None	None
v/c Ratio		0.77		5.44	0.56				1.32	0.42	0.34	
Control Delay	40.9		2034.3	10.4				210.9	49.2	30.1		
Queue Delay		0.0		0.0	0.3			0.0	0.0	0.0		
Total Delay	40.9		2034.3	10.7				210.9	49.2	30.1		
Queue Length 50th (ft)	137		~370	102			~144		34	54		
Queue Length 95th (ft)	#343		#733	442			#384		95	136		
Internal Link Dist (ft)	525			238			205		238			
Turn Bay Length (ft)										100		
Base Capacity (vph)	805		71	1063			181	181	767			
Starvation Cap Reductn	0		0	118			0		0	0		
Spillback Cap Reductn	0		0	0			0		0	0		
Storage Cap Reductn	0		0	0			0		0	0		
Reduced v/c Ratio	0.76		5.44	0.62			1.32	0.42	0.34			

## Intersection Summary

Cycle Length: 112

Actuated Cycle Length: 92.6

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

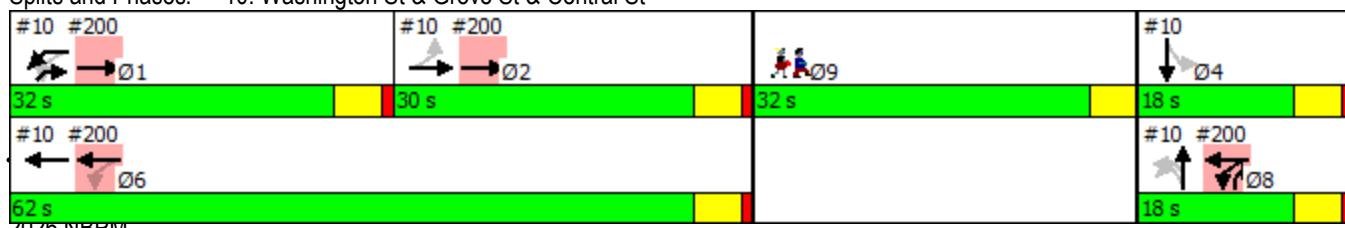
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 10: Washington St &amp; Grove St &amp; Central St



2026 NBPM

HCM Signalized Intersection Capacity Analysis  
10: Washington St & Grove St & Central St

Synchro 9 Report  
05/29/2019

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR
Lane Configurations												
Traffic Volume (vph)	1	423	115	30	5	342	501	29	11	131	16	47
Future Volume (vph)	1	423	115	30	5	342	501	29	11	131	16	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	-4%						0%				0%	
Total Lost time (s)	5.0					5.0	5.0				5.0	
Lane Util. Factor	0.95					1.00	1.00				1.00	
Frpb, ped/bikes	0.96					1.00	1.00				0.99	
Flpb, ped/bikes	1.00					0.98	1.00				0.99	
Fr <sub>t</sub>	0.96					1.00	0.99				0.97	
Flt Protected	1.00					0.95	1.00				0.97	
Satd. Flow (prot)	3044					1579	1678				1561	
Flt Permitted	0.95					0.14	1.00				0.78	
Satd. Flow (perm)	2905					239	1678				1263	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.90	0.90	0.90	0.90	0.86	0.86	0.86	0.86
Adj. Flow (vph)	1	455	124	32	6	380	557	32	13	152	19	55
RTOR Reduction (vph)	0	4	0	0	0	0	2	0	0	0	0	0
Lane Group Flow (vph)	0	608	0	0	0	386	587	0	0	0	239	0
Confl. Peds. (#/hr)	8		33	33	33	33		8		9		11
Confl. Bikes (#/hr)												
Heavy Vehicles (%)	0%	1%	1%	0%	25%	0%	1%	0%	0%	1%	0%	0%
Turn Type	Perm	NA		custom		Prot	NA		Perm	Perm	NA	
Protected Phases		2					1	6				8
Permitted Phases	2				1				8	8		
Actuated Green, G (s)	25.5					27.8	58.3					13.4
Effective Green, g (s)	25.5					27.8	58.3					13.4
Actuated g/C Ratio	0.27					0.29	0.61					0.14
Clearance Time (s)	5.0					5.0	5.0					5.0
Vehicle Extension (s)	3.0					3.0	3.0					3.0
Lane Grp Cap (vph)	779					69	1029					178
v/s Ratio Prot							0.35					
v/s Ratio Perm	c0.21					c1.61						c0.19
v/c Ratio	0.78					5.59	0.57					1.34
Uniform Delay, d1	32.2					33.6	10.9					40.8
Progression Factor	1.00					0.88	0.60					1.00
Incremental Delay, d2	5.1					2095.9	0.7					186.9
Delay (s)	37.3					2125.5	7.3					227.7
Level of Service	D					F	A					F
Approach Delay (s)	37.3						845.9					227.7
Approach LOS	D						F					F

Intersection Summary

HCM 2000 Control Delay	421.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.52		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	95.3%	ICU Level of Service	F
Analysis Period (min)	15		

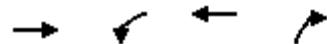
c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
10: Washington St & Grove St & Central St

Synchro 9 Report  
05/29/2019



Movement	SBL	SBT	SBR	SBR2	NER
Lane Configurations					
Traffic Volume (vph)	34	10	15	5	240
Future Volume (vph)	34	10	15	5	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Grade (%)	-2%				
Total Lost time (s)	5.0				5.0
Lane Util. Factor	1.00				0.88
Frpb, ped/bikes	0.97				1.00
Flpb, ped/bikes	1.00				1.00
Fr <sub>t</sub>	0.96				0.85
Flt Protected	0.97				1.00
Satd. Flow (prot)	1528				2558
Flt Permitted	0.81				1.00
Satd. Flow (perm)	1266				2558
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.91
Adj. Flow (vph)	40	12	18	6	264
RTOR Reduction (vph)	0	0	0	0	0
Lane Group Flow (vph)	0	76	0	0	264
Confl. Peds. (#/hr)	11		33	9	11
Confl. Bikes (#/hr)					1
Heavy Vehicles (%)	3%	0%	0%	0%	0%
Turn Type	Perm	NA			Over
Protected Phases		4			1
Permitted Phases		4			
Actuated Green, G (s)	13.4				27.8
Effective Green, g (s)	13.4				27.8
Actuated g/C Ratio	0.14				0.29
Clearance Time (s)	5.0				5.0
Vehicle Extension (s)	3.0				3.0
Lane Grp Cap (vph)	178				748
v/s Ratio Prot					0.10
v/s Ratio Perm		0.06			
v/c Ratio	0.43				0.35
Uniform Delay, d1	37.3				26.5
Progression Factor	1.00				1.00
Incremental Delay, d2	1.6				0.3
Delay (s)	38.9				26.8
Level of Service	D				C
Approach Delay (s)	38.9				
Approach LOS	D				
Intersection Summary					



Lane Group	EBT	WBL	WBT	NBR	Ø1	Ø2	Ø4	Ø6	Ø9
Lane Configurations									
Traffic Volume (vph)	708	45	878	96					
Future Volume (vph)	708	45	878	96					
Lane Group Flow (vph)	767	0	1003	130					
Turn Type	NA	custom	NA	Over					
Protected Phases	2 1	8	6 8	8	1	2	4	6	9
Permitted Phases					6	8			
Detector Phase	2 1	8	6 8	8					
Switch Phase									
Minimum Initial (s)		6.0		6.0	7.0	7.0	6.0	7.0	1.0
Minimum Split (s)		11.0		11.0	20.0	12.0	11.0	12.0	32.0
Total Split (s)		18.0		18.0	32.0	30.0	18.0	62.0	32.0
Total Split (%)		16.1%		16.1%	29%	27%	16%	55%	29%
Yellow Time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)		1.0		1.0	1.0	1.0	1.0	1.0	0.0
Lost Time Adjust (s)					0.0				
Total Lost Time (s)					5.0				
Lead/Lag					Lead	Lag			
Lead-Lag Optimize?					Yes	Yes			
Recall Mode		None		None	None	Min	None	Min	None
v/c Ratio	0.38		0.44	0.21					
Control Delay	6.2		6.0	0.8					
Queue Delay	0.4		0.0	0.0					
Total Delay	6.5		6.1	0.8					
Queue Length 50th (ft)	30		0	0					
Queue Length 95th (ft)	m101		207	0					
Internal Link Dist (ft)	238		106						
Turn Bay Length (ft)									
Base Capacity (vph)	2020		2266	612					
Starvation Cap Reductn	673		0	0					
Spillback Cap Reductn	0		49	0					
Storage Cap Reductn	0		0	0					
Reduced v/c Ratio	0.57		0.45	0.21					

#### Intersection Summary

Cycle Length: 112

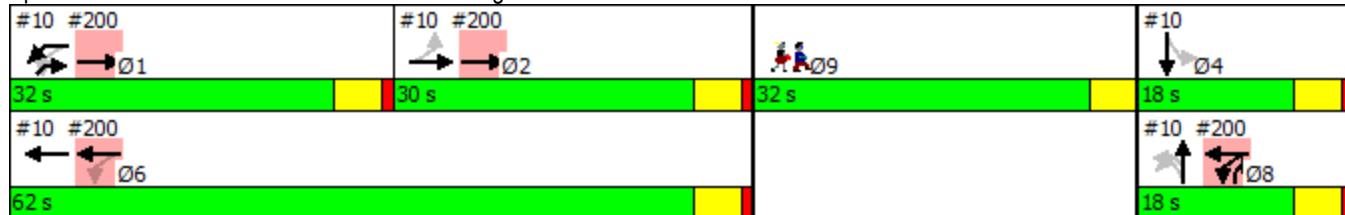
Actuated Cycle Length: 92.6

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

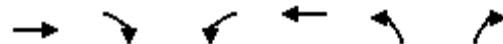
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 200: Cameron St & Washington St



HCM Signalized Intersection Capacity Analysis  
200: Cameron St & Washington St

Synchro 9 Report  
05/29/2019



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	708	36	45	878	0	96
Future Volume (vph)	708	36	45	878	0	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0		5.0
Lane Util. Factor	0.95			0.95		1.00
Frpb, ped/bikes	1.00			1.00		1.00
Flpb, ped/bikes	1.00			1.00		1.00
Fr <sub>t</sub>	0.99			1.00		0.86
Flt Protected	1.00			1.00		1.00
Satd. Flow (prot)	3187			3209		1450
Flt Permitted	1.00			0.89		1.00
Satd. Flow (perm)	3187			2849		1450
Peak-hour factor, PHF	0.97	0.97	0.92	0.92	0.74	0.74
Adj. Flow (vph)	730	37	49	954	0	130
RTOR Reduction (vph)	3	0	0	0	0	112
Lane Group Flow (vph)	764	0	0	1003	0	18
Confl. Peds. (#/hr)		35	35		41	
Confl. Bikes (#/hr)			4			
Heavy Vehicles (%)	1%	0%	0%	1%	0%	2%
Turn Type	NA	custom	NA		Over	
Protected Phases	2 1		8	6 8		8
Permitted Phases			6			8
Actuated Green, G (s)	58.3			71.7		13.4
Effective Green, g (s)	58.3			71.7		13.4
Actuated g/C Ratio	0.61			0.75		0.14
Clearance Time (s)					5.0	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)	1955			2201		204
v/s Ratio Prot	0.24			c0.06		0.01
v/s Ratio Perm				c0.28		
v/c Ratio	0.39			0.46		0.09
Uniform Delay, d1	9.3			4.4		35.5
Progression Factor	0.52			1.00		1.00
Incremental Delay, d2	0.1			0.2		0.2
Delay (s)	4.9			4.5		35.7
Level of Service	A			A		D
Approach Delay (s)	4.9			4.5	35.7	
Approach LOS	A			A	D	
<b>Intersection Summary</b>						
HCM 2000 Control Delay		6.8		HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio		0.43				
Actuated Cycle Length (s)		95.0		Sum of lost time (s)		19.0
Intersection Capacity Utilization		59.9%		ICU Level of Service		B
Analysis Period (min)		15				
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis  
210: Library Lot & Washington St

Synchro 9 Report  
05/29/2019



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	783	25	31	924	0	51
Future Volume (Veh/h)	783	25	31	924	0	51
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.92	0.92	0.73	0.73
Hourly flow rate (vph)	860	27	34	1004	0	70
Pedestrians	2			1	26	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	2	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	186			520		
pX, platoon unblocked			0.89		0.92	0.89
vC, conflicting volume			913		1472	470
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			643		1022	143
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		100	91
cM capacity (veh/h)			824		202	766
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	573	314	369	669	70	
Volume Left	0	0	34	0	0	
Volume Right	0	27	0	0	70	
cSH	1700	1700	824	1700	766	
Volume to Capacity	0.34	0.18	0.04	0.39	0.09	
Queue Length 95th (ft)	0	0	3	0	8	
Control Delay (s)	0.0	0.0	1.3	0.0	10.2	
Lane LOS			A		B	
Approach Delay (s)	0.0		0.5		10.2	
Approach LOS					B	
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			58.4%	ICU Level of Service		B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
220: Grove St & Spring St

Synchro 9 Report  
05/29/2019



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (veh/h)	82	76	128	19	11	123
Future Volume (Veh/h)	82	76	128	19	11	123
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.65	0.65	0.79	0.79	0.94	0.94
Hourly flow rate (vph)	126	117	162	24	12	131
Pedestrians	10		3			12
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	1		0			1
Right turn flare (veh)						
Median type		None			None	
Median storage veh						
Upstream signal (ft)					285	
pX, platoon unblocked						
vC, conflicting volume	342	196		196		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	342	196		196		
tC, single (s)	6.4	6.2		4.1		
tC, 2 stage (s)						
tF (s)	3.5	3.3		2.2		
p0 queue free %	80	86		99		
cM capacity (veh/h)	639	832		1377		
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	243	186	143			
Volume Left	126	0	12			
Volume Right	117	24	0			
cSH	720	1700	1377			
Volume to Capacity	0.34	0.11	0.01			
Queue Length 95th (ft)	37	0	1			
Control Delay (s)	12.5	0.0	0.7			
Lane LOS	B		A			
Approach Delay (s)	12.5	0.0	0.7			
Approach LOS	B					
Intersection Summary						
Average Delay		5.5				
Intersection Capacity Utilization		33.2%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
230: Grove St & Hampden St

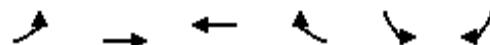
Synchro 9 Report  
05/29/2019



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	126	40	102	84	22	170
Future Volume (Veh/h)	126	40	102	84	22	170
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.75	0.75	0.92	0.92	0.75	0.75
Hourly flow rate (vph)	168	53	111	91	29	227
Pedestrians	2					13
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	0					1
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	444	172			204	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	444	172			204	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	70	94			98	
cM capacity (veh/h)	562	859			1377	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	221	202	256			
Volume Left	168	0	29			
Volume Right	53	91	0			
cSH	613	1700	1377			
Volume to Capacity	0.36	0.12	0.02			
Queue Length 95th (ft)	41	0	2			
Control Delay (s)	14.1	0.0	1.0			
Lane LOS	B		A			
Approach Delay (s)	14.1	0.0	1.0			
Approach LOS	B					
Intersection Summary						
Average Delay		5.0				
Intersection Capacity Utilization		41.9%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
240: Hampden St & Cameron St

Synchro 9 Report  
05/29/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	51	51	142	55	2	8
Future Volume (Veh/h)	51	51	142	55	2	8
Sign Control	Free	Free		Stop		
Grade	0%	0%		0%		
Peak Hour Factor	0.67	0.67	0.88	0.88	0.56	0.56
Hourly flow rate (vph)	76	76	161	63	4	14
Pedestrians	1	15		5		
Lane Width (ft)	12.0	12.0		12.0		
Walking Speed (ft/s)	4.0	4.0		4.0		
Percent Blockage	0	1		0		
Right turn flare (veh)						
Median type	None	None				
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	229			440	198	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	229			440	198	
tC, single (s)	4.1			6.4	6.3	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.4	
p0 queue free %	94			99	98	
cM capacity (veh/h)	1333			536	809	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	152	224	18			
Volume Left	76	0	4			
Volume Right	0	63	14			
cSH	1333	1700	727			
Volume to Capacity	0.06	0.13	0.02			
Queue Length 95th (ft)	5	0	2			
Control Delay (s)	4.2	0.0	10.1			
Lane LOS	A		B			
Approach Delay (s)	4.2	0.0	10.1			
Approach LOS			B			
Intersection Summary						
Average Delay		2.1				
Intersection Capacity Utilization		30.5%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
250: Brook St & Hampden St

Synchro 9 Report  
05/29/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	17	34	133	26	52	55
Future Volume (Veh/h)	17	34	133	26	52	55
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.69	0.69	0.88	0.88	0.92	0.92
Hourly flow rate (vph)	25	49	151	30	57	60
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (ft)				1034		
pX, platoon unblocked						
vC, conflicting volume	419	87	117			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	419	87	117			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	95	90			
cM capacity (veh/h)	534	977	1484			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	74	181	117			
Volume Left	25	151	0			
Volume Right	49	0	60			
cSH	763	1484	1700			
Volume to Capacity	0.10	0.10	0.07			
Queue Length 95th (ft)	8	8	0			
Control Delay (s)	10.2	6.6	0.0			
Lane LOS	B	A				
Approach Delay (s)	10.2	6.6	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay		5.2				
Intersection Capacity Utilization		25.4%		ICU Level of Service		A
Analysis Period (min)		15				

## Queues

11: Wellesley Ave/Town Hall &amp; Washington St

Synchro 9 Report

06/03/2019



Lane Group	EBT	EBC	WBL	WBT	NBT	Ø4	Ø7	Ø9
Lane Configurations								
Traffic Volume (vph)	386	434	130	505	0			
Future Volume (vph)	386	434	130	505	0			
Lane Group Flow (vph)	398	447	0	690	556			
Turn Type	NA	pm+ov	pm+pt	NA	NA			
Protected Phases	2	4	7	1	6	4	7	9
Permitted Phases	2	2		6	6	1		
Detector Phase	2	4	7	1	6	4	7	
Switch Phase								
Minimum Initial (s)	7.0		6.0	7.0		7.0	7.0	5.0
Minimum Split (s)	11.0		10.0	11.0		11.0	11.0	20.0
Total Split (s)	33.0		10.0	43.0		26.0	11.0	20.0
Total Split (%)	33.0%		10.0%	43.0%		26%	11%	20%
Yellow Time (s)	3.0		3.0	3.0		3.0	3.0	2.0
All-Red Time (s)	1.0		1.0	1.0		1.0	1.0	0.0
Lost Time Adjust (s)	0.0			0.0				
Total Lost Time (s)	4.0			4.0				
Lead/Lag	Lag		Lead			Lag	Lead	
Lead-Lag Optimize?	Yes		Yes			Yes	Yes	
Recall Mode	Min		None	Min		None	None	None
v/c Ratio	0.72	0.37		0.73	0.86			
Control Delay	34.3	1.4		23.6	48.0			
Queue Delay	0.0	0.5		0.0	0.0			
Total Delay	34.3	1.9		23.6	48.0			
Queue Length 50th (ft)	163	0		113	305			
Queue Length 95th (ft)	#388	31		#251	#625			
Internal Link Dist (ft)	440			812	7			
Turn Bay Length (ft)								
Base Capacity (vph)	611	1215		1020	644			
Starvation Cap Reductn	0	0		0	0			
Spillback Cap Reductn	0	371		0	0			
Storage Cap Reductn	0	0		0	0			
Reduced v/c Ratio	0.65	0.53		0.68	0.86			

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 81.5

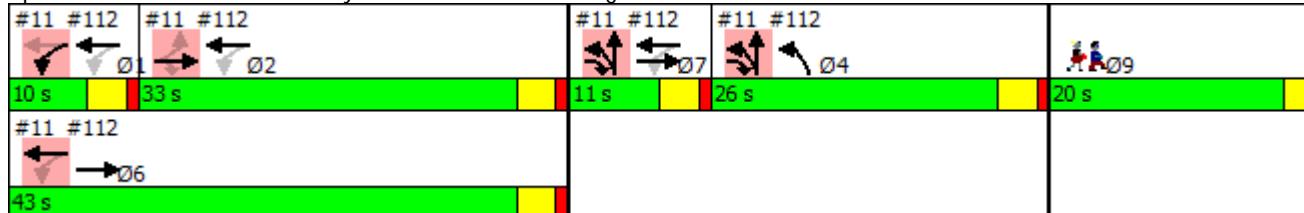
Natural Cycle: 90

Control Type: Actuated-Uncoordinated

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 11: Wellesley Ave/Town Hall &amp; Washington St



HCM Signalized Intersection Capacity Analysis  
11: Wellesley Ave/Town Hall & Washington St

Synchro 9 Report  
06/03/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	386	434	130	505	0	486	0	53	0	0	0
Future Volume (vph)	0	386	434	130	505	0	486	0	53	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0			4.0				
Lane Util. Factor	1.00	1.00		0.95			1.00					
Frpb, ped/bikes	1.00	1.00		1.00			1.00					
Flpb, ped/bikes	1.00	1.00		1.00			1.00					
Fr <sub>t</sub>	1.00	0.85		1.00			0.99					
Flt Protected	1.00	1.00		0.99			0.96					
Satd. Flow (prot)	1693	1425		3153			1569					
Flt Permitted	1.00	1.00		0.60			0.96					
Satd. Flow (perm)	1693	1425		1910			1569					
Peak-hour factor, PHF	0.97	0.97	0.97	0.92	0.92	0.92	0.97	0.97	0.97	0.92	0.92	0.92
Adj. Flow (vph)	0	398	447	141	549	0	501	0	55	0	0	0
RTOR Reduction (vph)	0	0	124	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	398	323	0	690	0	0	556	0	0	0	0
Confl. Peds. (#/hr)	2				2	2						
Heavy Vehicles (%)	0%	1%	2%	2%	2%	0%	3%	0%	2%	0%	0%	0%
Turn Type	NA	pm+ov	pm+pt	NA			Split	NA				
Protected Phases	2	4	7	1	6		4	7	4	7		
Permitted Phases	2	2	2	6	6	1						
Actuated Green, G (s)	26.5	59.9		36.6			33.4					
Effective Green, g (s)	26.5	59.9		36.6			33.4					
Actuated g/C Ratio	0.32	0.72		0.44			0.40					
Clearance Time (s)	4.0			4.0								
Vehicle Extension (s)	3.0			3.0								
Lane Grp Cap (vph)	541	1098		934			632					
v/s Ratio Prot	0.24	0.12		c0.05			c0.35					
v/s Ratio Perm		0.11		c0.27								
v/c Ratio	0.74	0.29		0.74			0.88					
Uniform Delay, d1	25.1	4.1		19.2			22.9					
Progression Factor	1.00	1.00		1.00			1.44					
Incremental Delay, d2	5.2	0.2		3.1			12.3					
Delay (s)	30.2	4.2		22.3			45.3					
Level of Service	C	A		C			D					
Approach Delay (s)	16.5			22.3			45.3			0.0		
Approach LOS	B			C			D			A		
<b>Intersection Summary</b>												
HCM 2000 Control Delay	26.1			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.86											
Actuated Cycle Length (s)	82.9			Sum of lost time (s)			18.0					
Intersection Capacity Utilization	85.8%			ICU Level of Service			E					
Analysis Period (min)	15											
c Critical Lane Group												

Timings  
10: Washington St & Grove St & Central St

Synchro 9 Report  
02/19/2020



Lane Group	EBT	WBL2	WBL	WBT	NBL2	NBL	NBT	SBL	SBT	NER	Ø9
Lane Configurations											
Traffic Volume (vph)	729	8	188	459	6	158	21	40	23	479	
Future Volume (vph)	729	8	188	459	6	158	21	40	23	479	
Lane Group Flow (vph)	945	0	213	538	0	0	280	0	92	545	
Turn Type	NA	custom	Prot	NA	Perm	Perm	NA	Perm	NA	Over	
Protected Phases	2		1	6			8		4	1	9
Permitted Phases			1		8	8		4			
Detector Phase	2	1	1	6	8	8	8	4	4	1	
Switch Phase											
Minimum Initial (s)	7.0	7.0	7.0	7.0	6.0	6.0	6.0	6.0	6.0	7.0	1.0
Minimum Split (s)	12.0	12.0	12.0	12.0	11.0	11.0	11.0	11.0	11.0	12.0	32.0
Total Split (s)	42.0	36.0	36.0	78.0	30.0	30.0	30.0	30.0	30.0	36.0	32.0
Total Split (%)	30.0%	25.7%	25.7%	55.7%	21.4%	21.4%	21.4%	21.4%	21.4%	25.7%	23%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lost Time Adjust (s)	0.0		0.0				0.0		0.0	0.0	
Total Lost Time (s)	5.0		5.0	5.0			5.0		5.0	5.0	
Lead/Lag	Lag	Lead	Lead							Lead	
Lead-Lag Optimize?	Yes	Yes	Yes							Yes	
Recall Mode	Min	None	None	Min	None	None	None	None	None	None	None
v/c Ratio	0.96		4.02	0.53			1.13		0.35	0.76	
Control Delay	62.4		1400.7	15.1			139.9		49.1	44.2	
Queue Delay	0.0		0.0	0.6			1.1		0.2	2.3	
Total Delay	62.4		1400.7	15.7			141.0		49.3	46.5	
Queue Length 50th (ft)	320		~267	138			~207		53	161	
Queue Length 95th (ft)	#625		#532	460			#475		109	#328	
Internal Link Dist (ft)	525			238			205		238		
Turn Bay Length (ft)										100	
Base Capacity (vph)	984		53	1018			248		265	716	
Starvation Cap Reductn	0		0	189			0		0	0	
Spillback Cap Reductn	0		0	0			19		20	79	
Storage Cap Reductn	0		0	0			0		0	0	
Reduced v/c Ratio	0.96		4.02	0.65			1.22		0.38	0.86	

#### Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 120.8

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

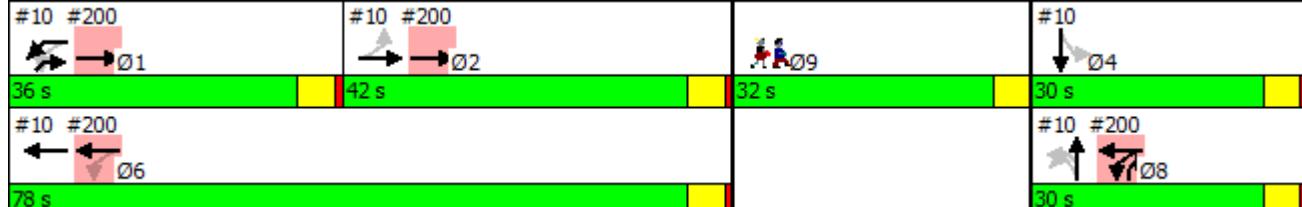
- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

#### Splits and Phases: 10: Washington St & Grove St & Central St



HCM Signalized Intersection Capacity Analysis  
10: Washington St & Grove St & Central St

Synchro 9 Report  
02/19/2020



Movement	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	729	86	7	8	188	459	36	6	158	21	53	40
Future Volume (vph)	729	86	7	8	188	459	36	6	158	21	53	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	-4%					0%				0%		
Total Lost time (s)	5.0				5.0	5.0				5.0		
Lane Util. Factor	0.95					1.00	1.00			1.00		
Frpb, ped/bikes	0.99					1.00	1.00			0.99		
Flpb, ped/bikes	1.00					1.00	1.00			0.99		
Fr <sub>t</sub>	0.98					1.00	0.99			0.97		
Flt Protected	1.00					0.95	1.00			0.97		
Satd. Flow (prot)	3164					1540	1656			1546		
Flt Permitted	1.00					0.13	1.00			0.74		
Satd. Flow (perm)	3164					206	1656			1185		
Peak-hour factor, PHF	0.87	0.87	0.87	0.92	0.92	0.92	0.92	0.85	0.85	0.85	0.85	0.75
Adj. Flow (vph)	838	99	8	9	204	499	39	7	186	25	62	53
RTOR Reduction (vph)	1	0	0	0	0	2	0	0	0	0	0	0
Lane Group Flow (vph)	944	0	0	0	213	536	0	0	0	280	0	0
Confl. Peds. (#/hr)	5	5	5	5			16		16		11	11
Confl. Bikes (#/hr)	5	5				2						
Heavy Vehicles (%)	2%	6%	0%	33%	4%	2%	0%	0%	2%	0%	2%	3%
Turn Type	NA		custom		Prot	NA		Perm	Perm	NA		Perm
Protected Phases	2					1	6				8	
Permitted Phases				1				8	8			4
Actuated Green, G (s)	37.7				31.5	74.2				25.4		
Effective Green, g (s)	37.7				31.5	74.2				25.4		
Actuated g/C Ratio	0.31				0.26	0.60				0.21		
Clearance Time (s)	5.0				5.0	5.0				5.0		
Vehicle Extension (s)	3.0				3.0	3.0				3.0		
Lane Grp Cap (vph)	967			52	996					244		
v/s Ratio Prot	c0.30				0.32							
v/s Ratio Perm				c1.03						c0.24		
v/c Ratio	0.98				4.10	0.54				1.15		
Uniform Delay, d1	42.4				45.9	14.5				49.0		
Progression Factor	1.00				0.94	0.79				1.00		
Incremental Delay, d2	23.1				1436.0	0.5				103.3		
Delay (s)	65.5				1479.3	12.0				152.2		
Level of Service	E				F	B				F		
Approach Delay (s)	65.5					428.1				152.2		
Approach LOS	E					F				F		

#### Intersection Summary

HCM 2000 Control Delay 174.4 HCM 2000 Level of Service F

HCM 2000 Volume to Capacity ratio 1.85

Actuated Cycle Length (s) 123.3 Sum of lost time (s) 19.0

Intersection Capacity Utilization 111.2% ICU Level of Service H

Analysis Period (min) 15

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
10: Washington St & Grove St & Central St

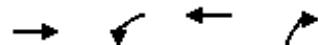
Synchro 9 Report  
02/19/2020



Movement	SBT	SBR	SBR2	NER	NER2
Lane Configurations					
Traffic Volume (vph)	23	5	1	479	1
Future Volume (vph)	23	5	1	479	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Grade (%)	-2%				
Total Lost time (s)	5.0			5.0	
Lane Util. Factor	1.00			0.88	
Frpb, ped/bikes	1.00			1.00	
Flpb, ped/bikes	1.00			1.00	
Fr <sub>t</sub>	0.99			0.85	
Flt Protected	0.97			1.00	
Satd. Flow (prot)	1592			2504	
Flt Permitted	0.77			1.00	
Satd. Flow (perm)	1262			2504	
Peak-hour factor, PHF	0.75	0.75	0.75	0.88	0.88
Adj. Flow (vph)	31	7	1	544	1
RTOR Reduction (vph)	0	0	0	64	0
Lane Group Flow (vph)	92	0	0	481	0
Confl. Peds. (#/hr)		5	16	11	
Confl. Bikes (#/hr)					
Heavy Vehicles (%)	5%	0%	0%	2%	100%
Turn Type	NA			Over	
Protected Phases	4			1	
Permitted Phases					
Actuated Green, G (s)	25.4			31.5	
Effective Green, g (s)	25.4			31.5	
Actuated g/C Ratio	0.21			0.26	
Clearance Time (s)	5.0			5.0	
Vehicle Extension (s)	3.0			3.0	
Lane Grp Cap (vph)	259			639	
v/s Ratio Prot			0.19		
v/s Ratio Perm	0.07				
v/c Ratio	0.36		0.75		
Uniform Delay, d1	41.9		42.3		
Progression Factor	1.00		1.00		
Incremental Delay, d2	0.8		5.0		
Delay (s)	42.8		47.3		
Level of Service	D		D		
Approach Delay (s)	42.8				
Approach LOS	D				
Intersection Summary					

Timings  
200: Cameron St & Washington St

Synchro 9 Report  
02/19/2020



Lane Group	EBT	WBL	WBT	NBR	Ø1	Ø2	Ø4	Ø6	Ø9
Lane Configurations	↑↓		↑↓	↑					
Traffic Volume (vph)	1277	28	692	125					
Future Volume (vph)	1277	28	692	125					
Lane Group Flow (vph)	1494	0	774	236					
Turn Type	NA	custom	NA	Over					
Protected Phases	2 1	8	6 8	8	1	2	4	6	9
Permitted Phases					6	8			
Detector Phase	2 1	8	6 8	8					
Switch Phase									
Minimum Initial (s)		6.0		6.0	7.0	7.0	6.0	7.0	1.0
Minimum Split (s)		11.0		11.0	12.0	12.0	11.0	12.0	32.0
Total Split (s)		30.0		30.0	36.0	42.0	30.0	78.0	32.0
Total Split (%)		21.4%		21.4%	26%	30%	21%	56%	23%
Yellow Time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)		1.0		1.0	1.0	1.0	1.0	1.0	0.0
Lost Time Adjust (s)					0.0				
Total Lost Time (s)					5.0				
Lead/Lag					Lead	Lag			
Lead-Lag Optimize?					Yes	Yes			
Recall Mode		None		None	None	Min	None	Min	None
v/c Ratio	0.76		0.33	0.41					
Control Delay	11.1		3.8	2.3					
Queue Delay	2.6		0.0	0.0					
Total Delay	13.7		3.8	2.3					
Queue Length 50th (ft)	80		0	0					
Queue Length 95th (ft)	m251		143	0					
Internal Link Dist (ft)	238		106						
Turn Bay Length (ft)									
Base Capacity (vph)	1969		2379	571					
Starvation Cap Reductn	342		0	0					
Spillback Cap Reductn	0		90	0					
Storage Cap Reductn	0		0	0					
Reduced v/c Ratio	0.92		0.34	0.41					

#### Intersection Summary

Cycle Length: 140

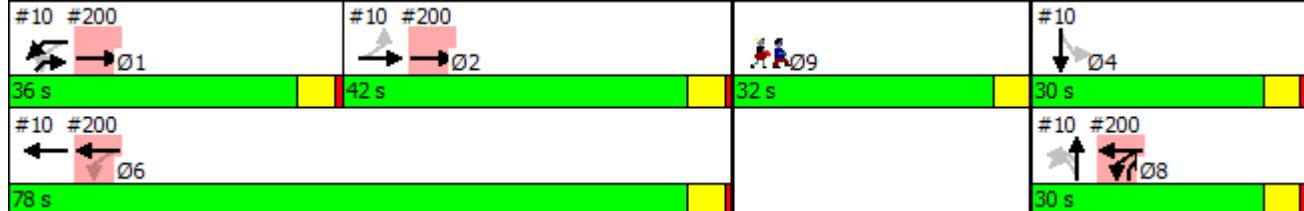
Actuated Cycle Length: 120.8

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 200: Cameron St & Washington St



HCM Signalized Intersection Capacity Analysis  
200: Cameron St & Washington St

Synchro 9 Report  
02/19/2020



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↓			↑↓		↑
Traffic Volume (vph)	1277	23	28	692	0	125
Future Volume (vph)	1277	23	28	692	0	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0		5.0
Lane Util. Factor	0.95			0.95		1.00
Frpb, ped/bikes	1.00			1.00		1.00
Flpb, ped/bikes	1.00			1.00		1.00
Fr <sub>t</sub>	1.00			1.00		0.86
Flt Protected	1.00			1.00		1.00
Satd. Flow (prot)	3207			3212		1465
Flt Permitted	1.00			0.86		1.00
Satd. Flow (perm)	3207			2775		1465
Peak-hour factor, PHF	0.87	0.87	0.93	0.93	0.53	0.53
Adj. Flow (vph)	1468	26	30	744	0	236
RTOR Reduction (vph)	1	0	0	0	0	187
Lane Group Flow (vph)	1493	0	0	774	0	49
Confl. Peds. (#/hr)		14	14		18	2
Confl. Bikes (#/hr)		5				1
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Turn Type	NA	custom	NA		Over	
Protected Phases	2 1		8	6 8		8
Permitted Phases			6			8
Actuated Green, G (s)	74.2			99.6		25.4
Effective Green, g (s)	74.2			99.6		25.4
Actuated g/C Ratio	0.60			0.81		0.21
Clearance Time (s)					5.0	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)	1929			2331		301
v/s Ratio Prot	c0.47		c0.07		0.03	
v/s Ratio Perm			0.20			
v/c Ratio	0.77		0.33		0.16	
Uniform Delay, d1	18.3		3.1		40.2	
Progression Factor	0.47		1.00		1.00	
Incremental Delay, d2	0.9		0.1		0.3	
Delay (s)	9.4		3.2		40.5	
Level of Service	A		A		D	
Approach Delay (s)	9.4		3.2	40.5		
Approach LOS	A		A	D		
<b>Intersection Summary</b>						
HCM 2000 Control Delay	10.4		HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.63					
Actuated Cycle Length (s)	123.3		Sum of lost time (s)		19.0	
Intersection Capacity Utilization	57.2%		ICU Level of Service		B	
Analysis Period (min)	15					
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis  
210: Library Lot & Washington St

Synchro 9 Report  
02/19/2020



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Traffic Volume (veh/h)	1390	12	12	720	0	14
Future Volume (Veh/h)	1390	12	12	720	0	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.83	0.90	0.90	0.54	0.54
Hourly flow rate (vph)	1675	14	13	800	0	26
Pedestrians	1				9	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	0				1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)	186			520		
pX, platoon unblocked			0.65		0.65	0.65
vC, conflicting volume			1698		2118	854
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1001		1636	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		100	96
cM capacity (veh/h)			452		59	705
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	1117	572	280	533	26	
Volume Left	0	0	13	0	0	
Volume Right	0	14	0	0	26	
cSH	1700	1700	452	1700	705	
Volume to Capacity	0.66	0.34	0.03	0.31	0.04	
Queue Length 95th (ft)	0	0	2	0	3	
Control Delay (s)	0.0	0.0	1.0	0.0	10.3	
Lane LOS			A		B	
Approach Delay (s)	0.0		0.4		10.3	
Approach LOS					B	
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			48.8%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
220: Grove St & Spring St

Synchro 9 Report  
02/19/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (veh/h)	45	69	168	35	15	104
Future Volume (Veh/h)	45	69	168	35	15	104
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.57	0.57	0.77	0.77	0.67	0.67
Hourly flow rate (vph)	79	121	218	45	22	155
Pedestrians	16		4			13
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	1		0			1
Right turn flare (veh)						
Median type		None			None	
Median storage veh)						
Upstream signal (ft)					285	
pX, platoon unblocked						
vC, conflicting volume	460	270		279		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	460	270		279		
tC, single (s)	6.4	6.2		4.1		
tC, 2 stage (s)						
tF (s)	3.5	3.3		2.2		
p0 queue free %	85	84		98		
cM capacity (veh/h)	541	746		1278		
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	200	263	177			
Volume Left	79	0	22			
Volume Right	121	45	0			
cSH	649	1700	1278			
Volume to Capacity	0.31	0.15	0.02			
Queue Length 95th (ft)	33	0	1			
Control Delay (s)	13.0	0.0	1.1			
Lane LOS	B		A			
Approach Delay (s)	13.0	0.0	1.1			
Approach LOS	B					
Intersection Summary						
Average Delay		4.4				
Intersection Capacity Utilization		34.4%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
230: Grove St & Hampden St

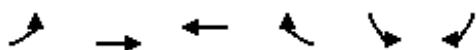
Synchro 9 Report  
02/19/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (veh/h)	71	35	158	314	62	73
Future Volume (Veh/h)	71	35	158	314	62	73
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.72	0.72	0.85	0.85	0.92	0.92
Hourly flow rate (vph)	99	49	186	369	67	79
Pedestrians	7					12
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	1					1
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	590	390			562	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	590	390			562	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	77	92			93	
cM capacity (veh/h)	439	653			989	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	148	555	146			
Volume Left	99	0	67			
Volume Right	49	369	0			
cSH	492	1700	989			
Volume to Capacity	0.30	0.33	0.07			
Queue Length 95th (ft)	31	0	5			
Control Delay (s)	15.4	0.0	4.4			
Lane LOS	C		A			
Approach Delay (s)	15.4	0.0	4.4			
Approach LOS	C					
Intersection Summary						
Average Delay		3.5				
Intersection Capacity Utilization		54.1%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
240: Hampden St & Cameron St

Synchro 9 Report  
02/19/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	124	198	169	130	4	13
Future Volume (Veh/h)	124	198	169	130	4	13
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.62	0.62	0.68	0.68	0.40	0.40
Hourly flow rate (vph)	200	319	249	191	10	33
Pedestrians		1	16		3	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	443			1082	348	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	443			1082	348	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	82			95	95	
cM capacity (veh/h)	1109			196	697	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	519	440	43			
Volume Left	200	0	10			
Volume Right	0	191	33			
cSH	1109	1700	437			
Volume to Capacity	0.18	0.26	0.10			
Queue Length 95th (ft)	16	0	8			
Control Delay (s)	4.7	0.0	14.1			
Lane LOS	A		B			
Approach Delay (s)	4.7	0.0	14.1			
Approach LOS			B			
Intersection Summary						
Average Delay		3.0				
Intersection Capacity Utilization		47.9%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
250: Brook St & Hampden St

Synchro 9 Report  
02/19/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Volume (veh/h)	84	117	216	48	45	76
Future Volume (Veh/h)	84	117	216	48	45	76
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.78	0.78	0.67	0.67
Hourly flow rate (vph)	102	143	277	62	67	113
Pedestrians	9					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	1					
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (ft)				1034		
pX, platoon unblocked						
vC, conflicting volume	748	132	189			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	748	132	189			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	66	84	80			
cM capacity (veh/h)	304	915	1381			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	245	339	180			
Volume Left	102	277	0			
Volume Right	143	0	113			
cSH	498	1381	1700			
Volume to Capacity	0.49	0.20	0.11			
Queue Length 95th (ft)	67	19	0			
Control Delay (s)	19.0	7.1	0.0			
Lane LOS	C	A				
Approach Delay (s)	19.0	7.1	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay		9.2				
Intersection Capacity Utilization		45.4%		ICU Level of Service		A
Analysis Period (min)		15				

Timings  
11: Wellesley Ave/Town Hall & Washington St

Synchro 9 Report  
02/19/2020



Lane Group	EBT	EBR	WBL	WBT	NBT	Ø4	Ø7	Ø9
Lane Configurations	↑	↑		↑↓	↓↑			
Traffic Volume (vph)	663	740	85	312	0			
Future Volume (vph)	663	740	85	312	0			
Lane Group Flow (vph)	705	787	0	447	558			
Turn Type	NA	pm+ov	Perm	NA	NA			
Protected Phases	2	4 7		6	4 7	4	7	9
Permitted Phases	2	2	6	6				
Detector Phase	2	4 7	6	6	4 7			
Switch Phase								
Minimum Initial (s)	7.0		7.0	7.0		7.0	7.0	5.0
Minimum Split (s)	22.0		22.0	22.0		11.0	11.0	20.0
Total Split (s)	37.0		37.0	37.0		11.0	22.0	20.0
Total Split (%)	41.1%		41.1%	41.1%		12%	24%	22%
Yellow Time (s)	3.0		3.0	3.0		3.0	3.0	2.0
All-Red Time (s)	1.0		1.0	1.0		1.0	1.0	0.0
Lost Time Adjust (s)	0.0			0.0				
Total Lost Time (s)	4.0			4.0				
Lead/Lag					Lag	Lead		
Lead-Lag Optimize?					Yes	Yes		
Recall Mode	Min		Min	Min	None	None	None	
v/c Ratio	0.93	0.57		1.05dl	0.91			
Control Delay	42.6	2.0		19.8	43.5			
Queue Delay	0.0	0.6		0.0	0.0			
Total Delay	42.6	2.6		19.8	43.5			
Queue Length 50th (ft)	262	0		67	216			
Queue Length 95th (ft)	#688	27		165	#538			
Internal Link Dist (ft)	440			812	7			
Turn Bay Length (ft)								
Base Capacity (vph)	755	1391		804	616			
Starvation Cap Reductn	0	4		0	0			
Spillback Cap Reductn	0	275		0	0			
Storage Cap Reductn	0	0		0	0			
Reduced v/c Ratio	0.93	0.71		0.56	0.91			

#### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 74

Natural Cycle: 110

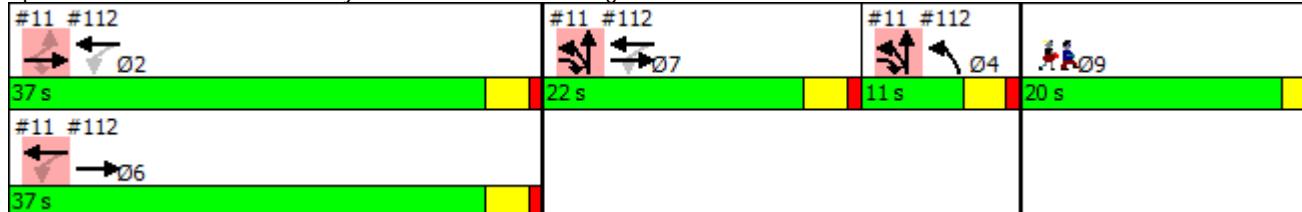
Control Type: Actuated-Uncoordinated

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 11: Wellesley Ave/Town Hall & Washington St



HCM Signalized Intersection Capacity Analysis  
11: Wellesley Ave/Town Hall & Washington St

Synchro 9 Report  
02/19/2020

Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	663	740	85	312	0	440	0	51	0	0	0
Future Volume (vph)	0	663	740	85	312	0	440	0	51	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0			4.0				
Lane Util. Factor	1.00	1.00		0.95			1.00					
Frpb, ped/bikes	1.00	1.00		1.00			1.00					
Flpb, ped/bikes	1.00	1.00		1.00			1.00					
Fr <sub>t</sub>	1.00	0.85		1.00			0.99					
Flt Protected	1.00	1.00		0.99			0.96					
Satd. Flow (prot)	1676	1425		3087			1558					
Flt Permitted	1.00	1.00		0.57			0.96					
Satd. Flow (perm)	1676	1425		1783			1558					
Peak-hour factor, PHF	0.94	0.94	0.94	0.89	0.89	0.89	0.88	0.88	0.88	0.92	0.92	0.92
Adj. Flow (vph)	0	705	787	96	351	0	500	0	58	0	0	0
RTOR Reduction (vph)	0	0	135	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	705	652	0	447	0	0	558	0	0	0	0
Confl. Peds. (#/hr)	1				1							
Heavy Vehicles (%)	0%	2%	2%	1%	5%	0%	4%	0%	0%	0%	0%	0%
Turn Type	NA	pm+ov	Perm	NA		Split	NA					
Protected Phases	2	4	7		6		4	7	4	7		
Permitted Phases	2	2	2	6	6							
Actuated Green, G (s)	33.3	62.6		33.3			29.3					
Effective Green, g (s)	33.3	62.6		33.3			29.3					
Actuated g/C Ratio	0.44	0.83		0.44			0.39					
Clearance Time (s)	4.0			4.0								
Vehicle Extension (s)	3.0			3.0								
Lane Grp Cap (vph)	738	1255		785			603					
v/s Ratio Prot	c0.42	0.20					c0.36					
v/s Ratio Perm		0.26		0.25								
v/c Ratio	0.96	0.52		1.05dl			0.93					
Uniform Delay, d1	20.4	2.0		15.8			22.1					
Progression Factor	1.00	1.00		1.00			1.06					
Incremental Delay, d2	22.6	0.4		1.0			19.1					
Delay (s)	43.0	2.3		16.7			42.4					
Level of Service	D	A		B			D					
Approach Delay (s)	21.6			16.7			42.4			0.0		
Approach LOS	C			B			D			A		
<b>Intersection Summary</b>												
HCM 2000 Control Delay	25.4			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.96											
Actuated Cycle Length (s)	75.6			Sum of lost time (s)			14.0					
Intersection Capacity Utilization	91.6%			ICU Level of Service			F					
Analysis Period (min)	15											
dl	Defacto Left Lane. Recode with 1 though lane as a left lane.											
c	Critical Lane Group											

Timings  
10: Washington St & Grove St & Central St

Synchro 9 Report  
02/19/2020



Lane Group	EBL	EBT	WBL2	WBL	WBT	NBL2	NBL	NBT	SBL	SBT	NER	Ø9
Lane Configurations												
Traffic Volume (vph)	1	411	5	332	487	11	146	16	33	9	233	
Future Volume (vph)	1	411	5	332	487	11	146	16	33	9	233	
Lane Group Flow (vph)	0	614	0	375	572	0	0	254	0	74	256	
Turn Type	Perm	NA	custom	Prot	NA	Perm	Perm	NA	Perm	NA	Over	
Protected Phases		2			1	6			8		4	1
Permitted Phases	2						8	8		4		
Detector Phase	2	2	1	1	6	8	8	8	4	4	1	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	6.0	6.0	6.0	6.0	6.0	7.0	1.0
Minimum Split (s)	12.0	12.0	20.0	20.0	12.0	11.0	11.0	11.0	11.0	11.0	20.0	32.0
Total Split (s)	30.0	30.0	32.0	32.0	62.0	18.0	18.0	18.0	18.0	18.0	32.0	32.0
Total Split (%)	26.8%	26.8%	28.6%	28.6%	55.4%	16.1%	16.1%	16.1%	16.1%	16.1%	28.6%	29%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lost Time Adjust (s)	0.0				0.0			0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0			5.0		5.0	5.0	
Lead/Lag	Lag	Lag	Lead	Lead							Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes							Yes	
Recall Mode	Min	Min	None	None	Min	None	None	None	None	None	None	None
v/c Ratio	0.78		5.28	0.54				1.40		0.40	0.33	
Control Delay	41.6		1965.3	10.2				242.2		48.2	30.0	
Queue Delay	0.0		0.0	0.3				0.0		0.0	0.0	
Total Delay	41.6		1965.3	10.5				242.2		48.2	30.0	
Queue Length 50th (ft)	138		~358	99				~160		33	52	
Queue Length 95th (ft)	#347		#716	423				#411		93	132	
Internal Link Dist (ft)	525			238				205		238		
Turn Bay Length (ft)											100	
Base Capacity (vph)	798		71	1064				182		187	767	
Starvation Cap Reductn	0		0	130				0		0	0	
Spillback Cap Reductn	0		0	0				0		0	0	
Storage Cap Reductn	0		0	0				0		0	0	
Reduced v/c Ratio	0.77		5.28	0.61				1.40		0.40	0.33	

#### Intersection Summary

Cycle Length: 112

Actuated Cycle Length: 92.5

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

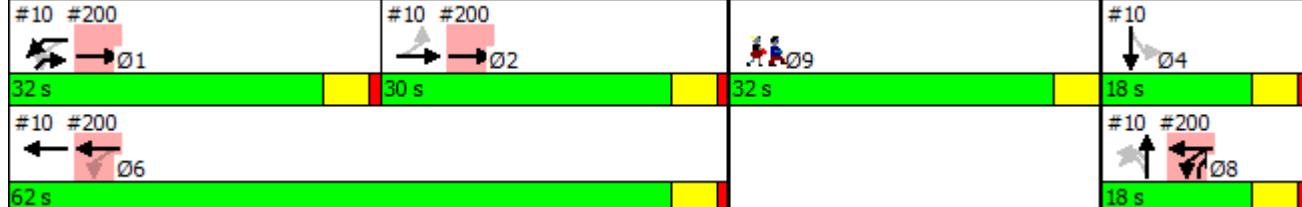
- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

#### Splits and Phases: 10: Washington St & Grove St & Central St



HCM Signalized Intersection Capacity Analysis  
10: Washington St & Grove St & Central St

Synchro 9 Report  
02/19/2020

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR
Lane Configurations												
Traffic Volume (vph)	1	411	130	29	5	332	487	28	11	146	16	45
Future Volume (vph)	1	411	130	29	5	332	487	28	11	146	16	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	-4%						0%				0%	
Total Lost time (s)	5.0					5.0	5.0				5.0	
Lane Util. Factor	0.95					1.00	1.00				1.00	
Frpb, ped/bikes	0.96					1.00	1.00				0.99	
Flpb, ped/bikes	1.00					0.98	1.00				0.99	
Fr <sub>t</sub>	0.96					1.00	0.99				0.97	
Flt Protected	1.00					0.95	1.00				0.97	
Satd. Flow (prot)	3022					1579	1678				1565	
Flt Permitted	0.95					0.14	1.00				0.78	
Satd. Flow (perm)	2885					239	1678				1262	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.90	0.90	0.90	0.90	0.86	0.86	0.86	0.86
Adj. Flow (vph)	1	442	140	31	6	369	541	31	13	170	19	52
RTOR Reduction (vph)	0	3	0	0	0	0	2	0	0	0	0	0
Lane Group Flow (vph)	0	611	0	0	0	375	570	0	0	0	254	0
Confl. Peds. (#/hr)	8		33	33	33	33		8		9		11
Confl. Bikes (#/hr)												
Heavy Vehicles (%)	0%	1%	1%	0%	25%	0%	1%	0%	0%	1%	0%	0%
Turn Type	Perm	NA		custom	Prot	NA		Perm	Perm	NA		
Protected Phases		2				1	6				8	
Permitted Phases	2			1				8	8			
Actuated Green, G (s)	25.5					27.8	58.3				13.4	
Effective Green, g (s)	25.5					27.8	58.3				13.4	
Actuated g/C Ratio	0.27					0.29	0.61				0.14	
Clearance Time (s)	5.0					5.0	5.0				5.0	
Vehicle Extension (s)	3.0					3.0	3.0				3.0	
Lane Grp Cap (vph)	775					70	1030				178	
v/s Ratio Prot							0.34					
v/s Ratio Perm	c0.21					c1.57					c0.20	
v/c Ratio	0.79					5.36	0.55				1.43	
Uniform Delay, d1	32.2					33.6	10.7				40.8	
Progression Factor	1.00					0.88	0.61				1.00	
Incremental Delay, d2	5.3					1989.3	0.6				221.5	
Delay (s)	37.5					2018.9	7.1				262.2	
Level of Service	D					F	A				F	
Approach Delay (s)	37.5						803.8				262.2	
Approach LOS	D						F				F	
Intersection Summary												
HCM 2000 Control Delay	401.2					HCM 2000 Level of Service					F	
HCM 2000 Volume to Capacity ratio	2.48											
Actuated Cycle Length (s)	94.9					Sum of lost time (s)					19.0	
Intersection Capacity Utilization	95.8%					ICU Level of Service					F	
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
10: Washington St & Grove St & Central St

Synchro 9 Report  
02/19/2020



Movement	SBL	SBT	SBR	SBR2	NER
Lane Configurations					
Traffic Volume (vph)	33	9	15	5	233
Future Volume (vph)	33	9	15	5	233
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Grade (%)	-2%				
Total Lost time (s)	5.0				5.0
Lane Util. Factor	1.00				0.88
Frpb, ped/bikes	0.97				1.00
Flpb, ped/bikes	1.00				1.00
Fr <sub>t</sub>	0.96				0.85
Flt Protected	0.97				1.00
Satd. Flow (prot)	1525				2558
Flt Permitted	0.83				1.00
Satd. Flow (perm)	1305				2558
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.91
Adj. Flow (vph)	39	11	18	6	256
RTOR Reduction (vph)	0	0	0	0	0
Lane Group Flow (vph)	0	74	0	0	256
Confl. Peds. (#/hr)	11		33	9	11
Confl. Bikes (#/hr)					1
Heavy Vehicles (%)	3%	0%	0%	0%	0%
Turn Type	Perm	NA			Over
Protected Phases		4			1
Permitted Phases		4			
Actuated Green, G (s)	13.4				27.8
Effective Green, g (s)	13.4				27.8
Actuated g/C Ratio	0.14				0.29
Clearance Time (s)	5.0				5.0
Vehicle Extension (s)	3.0				3.0
Lane Grp Cap (vph)	184				749
v/s Ratio Prot					0.10
v/s Ratio Perm	0.06				
v/c Ratio	0.40				0.34
Uniform Delay, d1	37.1				26.4
Progression Factor	1.00				1.00
Incremental Delay, d2	1.4				0.3
Delay (s)	38.5				26.6
Level of Service	D				C
Approach Delay (s)	38.5				
Approach LOS	D				
Intersection Summary					

Timings  
200: Cameron St & Washington St

Synchro 9 Report  
02/19/2020



Lane Group	EBT	WBL	WBT	NBR	Ø1	Ø2	Ø4	Ø6	Ø9
Lane Configurations	↑↓		↑↓	↑					
Traffic Volume (vph)	687	44	852	142					
Future Volume (vph)	687	44	852	142					
Lane Group Flow (vph)	744	0	974	192					
Turn Type	NA	custom	NA	Over					
Protected Phases	2 1	8	6 8	8	1	2	4	6	9
Permitted Phases					6	8			
Detector Phase	2 1	8	6 8	8					
Switch Phase									
Minimum Initial (s)		6.0		6.0	7.0	7.0	6.0	7.0	1.0
Minimum Split (s)		11.0		11.0	20.0	12.0	11.0	12.0	32.0
Total Split (s)		18.0		18.0	32.0	30.0	18.0	62.0	32.0
Total Split (%)		16.1%		16.1%	29%	27%	16%	55%	29%
Yellow Time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)		1.0		1.0	1.0	1.0	1.0	1.0	0.0
Lost Time Adjust (s)					0.0				
Total Lost Time (s)					5.0				
Lead/Lag					Lead	Lag			
Lead-Lag Optimize?					Yes	Yes			
Recall Mode		None		None	None	Min	None	Min	None
v/c Ratio	0.37		0.43	0.31					
Control Delay	6.1		5.9	1.3					
Queue Delay	0.4		0.0	0.0					
Total Delay	6.5		5.9	1.3					
Queue Length 50th (ft)	28		0	0					
Queue Length 95th (ft)	m97		200	0					
Internal Link Dist (ft)	238		106						
Turn Bay Length (ft)									
Base Capacity (vph)	2022		2274	617					
Starvation Cap Reductn	696		0	0					
Spillback Cap Reductn	0		49	0					
Storage Cap Reductn	0		0	0					
Reduced v/c Ratio	0.56		0.44	0.31					

#### Intersection Summary

Cycle Length: 112

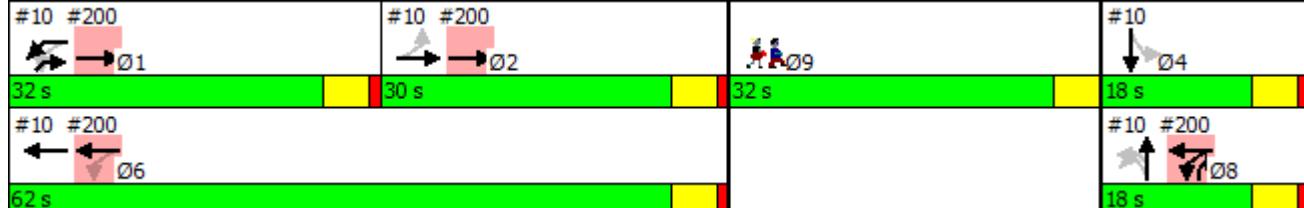
Actuated Cycle Length: 92.5

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 200: Cameron St & Washington St



HCM Signalized Intersection Capacity Analysis  
200: Cameron St & Washington St

Synchro 9 Report  
02/19/2020



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Traffic Volume (vph)	687	35	44	852	0	142
Future Volume (vph)	687	35	44	852	0	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0		5.0
Lane Util. Factor	0.95			0.95		1.00
Frpb, ped/bikes	1.00			1.00		1.00
Flpb, ped/bikes	1.00			1.00		1.00
Fr <sub>t</sub>	0.99			1.00		0.86
Flt Protected	1.00			1.00		1.00
Satd. Flow (prot)	3187			3209		1450
Flt Permitted	1.00			0.89		1.00
Satd. Flow (perm)	3187			2857		1450
Peak-hour factor, PHF	0.97	0.97	0.92	0.92	0.74	0.74
Adj. Flow (vph)	708	36	48	926	0	192
RTOR Reduction (vph)	3	0	0	0	0	165
Lane Group Flow (vph)	741	0	0	974	0	27
Confl. Peds. (#/hr)		35	35		41	
Confl. Bikes (#/hr)		4				
Heavy Vehicles (%)	1%	0%	0%	1%	0%	2%
Turn Type	NA	custom	NA		Over	
Protected Phases	2 1		8	6 8		8
Permitted Phases			6			8
Actuated Green, G (s)	58.3			71.7		13.4
Effective Green, g (s)	58.3			71.7		13.4
Actuated g/C Ratio	0.61			0.76		0.14
Clearance Time (s)					5.0	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)	1957			2208		204
v/s Ratio Prot	0.23		c0.06		0.02	
v/s Ratio Perm			c0.27			
v/c Ratio	0.38		0.44		0.13	
Uniform Delay, d1	9.2		4.3		35.7	
Progression Factor	0.52		1.00		1.00	
Incremental Delay, d2	0.1		0.1		0.3	
Delay (s)	4.9		4.4		36.0	
Level of Service	A		A		D	
Approach Delay (s)	4.9		4.4	36.0		
Approach LOS	A		A	D		
<b>Intersection Summary</b>						
HCM 2000 Control Delay	7.7		HCM 2000 Level of Service		A	
HCM 2000 Volume to Capacity ratio	0.42					
Actuated Cycle Length (s)	94.9		Sum of lost time (s)		19.0	
Intersection Capacity Utilization	58.4%		ICU Level of Service		B	
Analysis Period (min)	15					
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis  
210: Library Lot & Washington St

Synchro 9 Report  
02/19/2020



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Traffic Volume (veh/h)	806	24	30	897	0	49
Future Volume (Veh/h)	806	24	30	897	0	49
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.92	0.92	0.73	0.73
Hourly flow rate (vph)	886	26	33	975	0	67
Pedestrians	2			1	26	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	2	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)	186			520		
pX, platoon unblocked			0.89		0.94	0.89
vC, conflicting volume			938		1480	483
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			684		934	173
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		100	91
cM capacity (veh/h)			800		235	737
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	591	321	358	650	67	
Volume Left	0	0	33	0	0	
Volume Right	0	26	0	0	67	
cSH	1700	1700	800	1700	737	
Volume to Capacity	0.35	0.19	0.04	0.38	0.09	
Queue Length 95th (ft)	0	0	3	0	7	
Control Delay (s)	0.0	0.0	1.3	0.0	10.4	
Lane LOS			A		B	
Approach Delay (s)	0.0		0.5		10.4	
Approach LOS				B		
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			56.9%		ICU Level of Service	B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
220: Grove St & Spring St

Synchro 9 Report  
02/19/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (veh/h)	80	93	124	19	11	139
Future Volume (Veh/h)	80	93	124	19	11	139
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.65	0.65	0.79	0.79	0.94	0.94
Hourly flow rate (vph)	123	143	157	24	12	148
Pedestrians	10		3			12
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	1		0			1
Right turn flare (veh)						
Median type		None			None	
Median storage veh)						
Upstream signal (ft)					285	
pX, platoon unblocked						
vC, conflicting volume	354	191		191		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	354	191		191		
tC, single (s)	6.4	6.2		4.1		
tC, 2 stage (s)						
tF (s)	3.5	3.3		2.2		
p0 queue free %	80	83		99		
cM capacity (veh/h)	629	838		1383		
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	266	181	160			
Volume Left	123	0	12			
Volume Right	143	24	0			
cSH	727	1700	1383			
Volume to Capacity	0.37	0.11	0.01			
Queue Length 95th (ft)	42	0	1			
Control Delay (s)	12.8	0.0	0.6			
Lane LOS	B		A			
Approach Delay (s)	12.8	0.0	0.6			
Approach LOS	B					
Intersection Summary						
Average Delay		5.8				
Intersection Capacity Utilization		34.7%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
230: Grove St & Hampden St

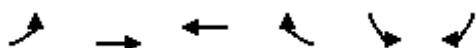
Synchro 9 Report  
02/19/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (veh/h)	122	39	99	82	40	165
Future Volume (Veh/h)	122	39	99	82	40	165
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.75	0.75	0.92	0.92	0.75	0.75
Hourly flow rate (vph)	163	52	108	89	53	220
Pedestrians	2				13	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	0				1	
Right turn flare (veh)						
Median type		None			None	
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	480	168			199	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	480	168			199	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	69	94			96	
cM capacity (veh/h)	526	863			1383	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	215	197	273			
Volume Left	163	0	53			
Volume Right	52	89	0			
cSH	581	1700	1383			
Volume to Capacity	0.37	0.12	0.04			
Queue Length 95th (ft)	42	0	3			
Control Delay (s)	14.8	0.0	1.8			
Lane LOS	B		A			
Approach Delay (s)	14.8	0.0	1.8			
Approach LOS	B					
Intersection Summary						
Average Delay		5.3				
Intersection Capacity Utilization		42.2%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
240: Hampden St & Cameron St

Synchro 9 Report  
02/19/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	68	49	138	102	2	7
Future Volume (Veh/h)	68	49	138	102	2	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.67	0.67	0.88	0.88	0.56	0.56
Hourly flow rate (vph)	101	73	157	116	4	13
Pedestrians		1	15		5	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	278			510	221	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	278			510	221	
tC, single (s)	4.1			6.4	6.3	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.4	
p0 queue free %	92			99	98	
cM capacity (veh/h)	1279			477	786	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	174	273	17			
Volume Left	101	0	4			
Volume Right	0	116	13			
cSH	1279	1700	682			
Volume to Capacity	0.08	0.16	0.02			
Queue Length 95th (ft)	6	0	2			
Control Delay (s)	5.0	0.0	10.4			
Lane LOS	A		B			
Approach Delay (s)	5.0	0.0	10.4			
Approach LOS			B			
Intersection Summary						
Average Delay		2.2				
Intersection Capacity Utilization		33.7%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
250: Brook St & Hampden St

Synchro 9 Report  
02/19/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			U	U	
Traffic Volume (veh/h)	17	33	177	25	50	54
Future Volume (Veh/h)	17	33	177	25	50	54
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.69	0.69	0.88	0.88	0.92	0.92
Hourly flow rate (vph)	25	48	201	28	54	59
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				1034		
pX, platoon unblocked						
vC, conflicting volume	514	84	113			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	514	84	113			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	95	87			
cM capacity (veh/h)	454	981	1489			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	73	229	113			
Volume Left	25	201	0			
Volume Right	48	0	59			
cSH	702	1489	1700			
Volume to Capacity	0.10	0.13	0.07			
Queue Length 95th (ft)	9	12	0			
Control Delay (s)	10.7	7.0	0.0			
Lane LOS	B	A				
Approach Delay (s)	10.7	7.0	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay		5.7				
Intersection Capacity Utilization		27.8%		ICU Level of Service		A
Analysis Period (min)		15				

Timings  
11: Wellesley Ave/Town Hall & Washington St

Synchro 9 Report  
02/19/2020



Lane Group	EBT	EBR	WBL	WBT	NBT	Ø4	Ø7	Ø9
Lane Configurations	4	1		4	4			
Traffic Volume (vph)	374	469	127	490	0			
Future Volume (vph)	374	469	127	490	0			
Lane Group Flow (vph)	386	484	0	671	540			
Turn Type	NA	pm+ov	pm+pt	NA	NA			
Protected Phases	2	4 7	1	6	4 7	4	7	9
Permitted Phases	2	2	6	6 1				
Detector Phase	2	4 7	1	6	4 7			
Switch Phase								
Minimum Initial (s)	7.0		6.0	7.0		7.0	7.0	5.0
Minimum Split (s)	11.0		10.0	11.0		11.0	11.0	20.0
Total Split (s)	33.0		10.0	43.0		26.0	11.0	20.0
Total Split (%)	33.0%		10.0%	43.0%		26%	11%	20%
Yellow Time (s)	3.0		3.0	3.0		3.0	3.0	2.0
All-Red Time (s)	1.0		1.0	1.0		1.0	1.0	0.0
Lost Time Adjust (s)	0.0		0.0					
Total Lost Time (s)	4.0		4.0					
Lead/Lag	Lag		Lead		Lag	Lead		
Lead-Lag Optimize?	Yes		Yes		Yes	Yes		
Recall Mode	Min		None	Min	None	None	None	
v/c Ratio	0.72	0.40		0.71	0.82			
Control Delay	34.5	1.5		23.2	44.5			
Queue Delay	0.0	0.6		0.0	0.0			
Total Delay	34.5	2.1		23.2	44.5			
Queue Length 50th (ft)	156	0		108	296			
Queue Length 95th (ft)	#369	32		#232	#601			
Internal Link Dist (ft)	440			812	7			
Turn Bay Length (ft)								
Base Capacity (vph)	620	1221		1041	655			
Starvation Cap Reductn	0	0		0	0			
Spillback Cap Reductn	0	386		0	0			
Storage Cap Reductn	0	0		0	0			
Reduced v/c Ratio	0.62	0.58		0.64	0.82			

#### Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 80.5

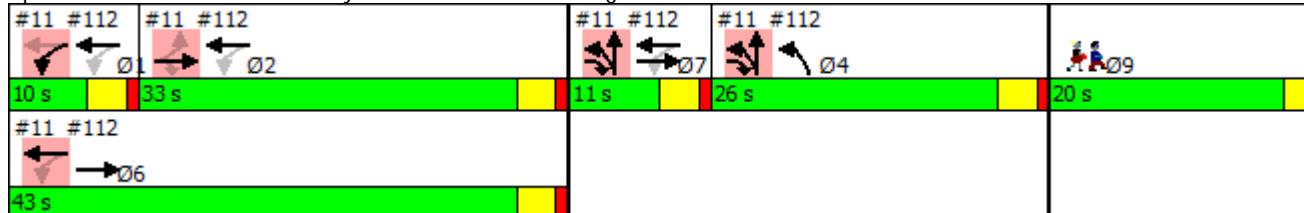
Natural Cycle: 90

Control Type: Actuated-Uncoordinated

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 11: Wellesley Ave/Town Hall & Washington St



HCM Signalized Intersection Capacity Analysis  
11: Wellesley Ave/Town Hall & Washington St

Synchro 9 Report  
02/19/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	374	469	127	490	0	472	0	51	0	0	0
Future Volume (vph)	0	374	469	127	490	0	472	0	51	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0			4.0				
Lane Util. Factor	1.00	1.00		0.95			1.00					
Frpb, ped/bikes	1.00	1.00		1.00			1.00					
Flpb, ped/bikes	1.00	1.00		1.00			1.00					
Fr <sub>t</sub>	1.00	0.85		1.00			0.99					
Flt Protected	1.00	1.00		0.99			0.96					
Satd. Flow (prot)	1693	1425		3153			1569					
Flt Permitted	1.00	1.00		0.60			0.96					
Satd. Flow (perm)	1693	1425		1924			1569					
Peak-hour factor, PHF	0.97	0.97	0.97	0.92	0.92	0.92	0.97	0.97	0.97	0.92	0.92	0.92
Adj. Flow (vph)	0	386	484	138	533	0	487	0	53	0	0	0
RTOR Reduction (vph)	0	0	136	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	386	348	0	671	0	0	540	0	0	0	0
Confl. Peds. (#/hr)	2				2	2						
Heavy Vehicles (%)	0%	1%	2%	2%	2%	0%	3%	0%	2%	0%	0%	0%
Turn Type	NA	pm+ov	pm+pt	NA			Split	NA				
Protected Phases	2	4 7	1	6			4 7	4 7				
Permitted Phases	2	2	2	6	6 1							
Actuated Green, G (s)	25.4	58.9		35.5			33.5					
Effective Green, g (s)	25.4	58.9		35.5			33.5					
Actuated g/C Ratio	0.31	0.72		0.43			0.41					
Clearance Time (s)	4.0		4.0									
Vehicle Extension (s)	3.0		3.0									
Lane Grp Cap (vph)	525	1094		925			641					
v/s Ratio Prot	0.23	0.13		c0.05			c0.34					
v/s Ratio Perm		0.11		c0.26								
v/c Ratio	0.74	0.32		0.73			0.84					
Uniform Delay, d1	25.2	4.2		19.2			21.8					
Progression Factor	1.00	1.00		1.00			1.45					
Incremental Delay, d2	5.3	0.2		2.9			9.1					
Delay (s)	30.6	4.4		22.0			40.8					
Level of Service	C	A		C			D					
Approach Delay (s)	16.0		22.0				40.8		0.0			
Approach LOS	B		C				D		A			
<b>Intersection Summary</b>												
HCM 2000 Control Delay	24.4			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.84											
Actuated Cycle Length (s)	81.9			Sum of lost time (s)			18.0					
Intersection Capacity Utilization	83.5%			ICU Level of Service			E					
Analysis Period (min)	15											
c Critical Lane Group												

Timings  
10: Washington St & Grove St & Central St

Synchro 9 Report  
02/19/2020



Lane Group	EBT	WBL2	WBL	WBT	NBL2	NBL	NBT	SBL	SBT	NER	Ø9
Lane Configurations											
Traffic Volume (vph)	752	9	194	473	6	162	22	41	21	494	
Future Volume (vph)	752	9	194	473	6	162	22	41	21	494	
Lane Group Flow (vph)	974	0	221	554	0	0	288	0	91	562	
Turn Type	NA	custom	Prot	NA	Perm	Perm	NA	Perm	NA	Over	
Protected Phases	2		1	6			8		4	1	9
Permitted Phases			1		8	8		4			
Detector Phase	2	1	1	6	8	8	8	4	4	1	
Switch Phase											
Minimum Initial (s)	7.0	7.0	7.0	7.0	6.0	6.0	6.0	6.0	6.0	7.0	1.0
Minimum Split (s)	12.0	12.0	12.0	12.0	11.0	11.0	11.0	11.0	11.0	12.0	32.0
Total Split (s)	42.0	36.0	36.0	78.0	30.0	30.0	30.0	30.0	30.0	36.0	32.0
Total Split (%)	30.0%	25.7%	25.7%	55.7%	21.4%	21.4%	21.4%	21.4%	21.4%	25.7%	23%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lost Time Adjust (s)	0.0		0.0				0.0		0.0	0.0	
Total Lost Time (s)	5.0		5.0	5.0			5.0		5.0	5.0	
Lead/Lag	Lag	Lead	Lead							Lead	
Lead-Lag Optimize?	Yes	Yes	Yes							Yes	
Recall Mode	Min	None	None	Min	None	None	None	None	None	None	None
v/c Ratio	0.99		4.17	0.54			1.15		0.35	0.78	
Control Delay	68.3		1467.1	15.4			147.6		49.2	45.5	
Queue Delay	0.0		0.0	0.6			2.1		0.5	3.2	
Total Delay	68.3		1467.1	16.0			149.7		49.7	48.7	
Queue Length 50th (ft)	333		~279	142			~217		53	169	
Queue Length 95th (ft)	#655		#549	480			#491		108	#348	
Internal Link Dist (ft)	525			238			205		238		
Turn Bay Length (ft)										100	
Base Capacity (vph)	985		53	1018			250		262	716	
Starvation Cap Reductn	0		0	174			0		0	0	
Spillback Cap Reductn	0		0	0			35		37	81	
Storage Cap Reductn	0		0	0			0		0	0	
Reduced v/c Ratio	0.99		4.17	0.66			1.34		0.40	0.89	

#### Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 120.8

Natural Cycle: 110

Control Type: Actuated-Uncoordinated

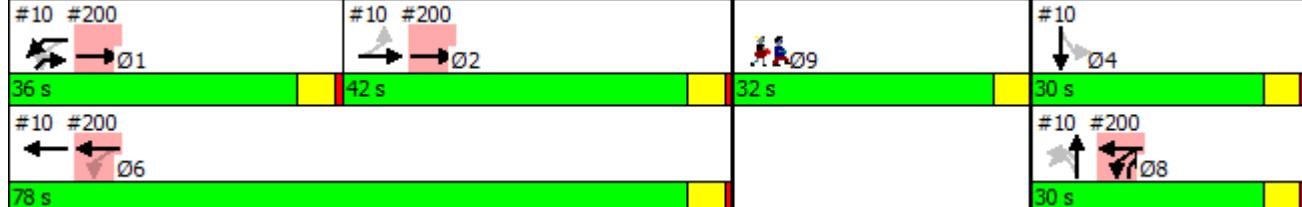
- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

#### Splits and Phases: 10: Washington St & Grove St & Central St



HCM Signalized Intersection Capacity Analysis  
10: Washington St & Grove St & Central St

Synchro 9 Report  
02/19/2020



Movement	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	752	88	8	9	194	473	37	6	162	22	54	41
Future Volume (vph)	752	88	8	9	194	473	37	6	162	22	54	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	-4%					0%				0%		
Total Lost time (s)	5.0				5.0	5.0				5.0		
Lane Util. Factor	0.95					1.00	1.00			1.00		
Frpb, ped/bikes	0.99					1.00	1.00			0.99		
Flpb, ped/bikes	1.00					1.00	1.00			0.99		
Fr <sub>t</sub>	0.98					1.00	0.99			0.97		
Flt Protected	1.00					0.95	1.00			0.97		
Satd. Flow (prot)	3164					1539	1657			1546		
Flt Permitted	1.00					0.13	1.00			0.74		
Satd. Flow (perm)	3164					206	1657			1191		
Peak-hour factor, PHF	0.87	0.87	0.87	0.92	0.92	0.92	0.92	0.85	0.85	0.85	0.85	0.75
Adj. Flow (vph)	864	101	9	10	211	514	40	7	191	26	64	55
RTOR Reduction (vph)	1	0	0	0	0	2	0	0	0	0	0	0
Lane Group Flow (vph)	973	0	0	0	221	552	0	0	0	288	0	0
Confl. Peds. (#/hr)	5	5	5	5		16		16		11	11	
Confl. Bikes (#/hr)	5	5				2						
Heavy Vehicles (%)	2%	6%	0%	33%	4%	2%	0%	0%	2%	0%	2%	3%
Turn Type	NA		custom		Prot	NA		Perm	Perm	NA		Perm
Protected Phases	2					1	6				8	
Permitted Phases				1				8	8			4
Actuated Green, G (s)	37.7				31.5	74.2				25.4		
Effective Green, g (s)	37.7				31.5	74.2				25.4		
Actuated g/C Ratio	0.31				0.26	0.60				0.21		
Clearance Time (s)	5.0				5.0	5.0				5.0		
Vehicle Extension (s)	3.0				3.0	3.0				3.0		
Lane Grp Cap (vph)	967				52	997				245		
v/s Ratio Prot	c0.31					0.33						
v/s Ratio Perm					c1.07					c0.24		
v/c Ratio	1.01					4.25	0.55			1.18		
Uniform Delay, d1	42.8				45.9	14.7				49.0		
Progression Factor	1.00				0.95	0.79				1.00		
Incremental Delay, d2	30.5				1504.6	0.6				113.3		
Delay (s)	73.3				1548.0	12.3				162.2		
Level of Service	E				F	B				F		
Approach Delay (s)	73.3					450.2				162.2		
Approach LOS	E					F				F		

#### Intersection Summary

HCM 2000 Control Delay 185.2 HCM 2000 Level of Service F

HCM 2000 Volume to Capacity ratio 1.92

Actuated Cycle Length (s) 123.3 Sum of lost time (s) 19.0

Intersection Capacity Utilization 113.4% ICU Level of Service H

Analysis Period (min) 15

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
10: Washington St & Grove St & Central St

Synchro 9 Report  
02/19/2020



Movement	SBT	SBR	SBR2	NER	NER2
Lane Configurations					
Traffic Volume (vph)	21	5	1	494	1
Future Volume (vph)	21	5	1	494	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Grade (%)	-2%				
Total Lost time (s)	5.0			5.0	
Lane Util. Factor	1.00			0.88	
Frpb, ped/bikes	1.00			1.00	
Flpb, ped/bikes	1.00			1.00	
Fr <sub>t</sub>	0.99			0.85	
Flt Protected	0.97			1.00	
Satd. Flow (prot)	1590			2504	
Flt Permitted	0.76			1.00	
Satd. Flow (perm)	1247			2504	
Peak-hour factor, PHF	0.75	0.75	0.75	0.88	0.88
Adj. Flow (vph)	28	7	1	561	1
RTOR Reduction (vph)	0	0	0	64	0
Lane Group Flow (vph)	91	0	0	498	0
Confl. Peds. (#/hr)		5	16	11	
Confl. Bikes (#/hr)					
Heavy Vehicles (%)	5%	0%	0%	2%	100%
Turn Type	NA			Over	
Protected Phases	4			1	
Permitted Phases					
Actuated Green, G (s)	25.4			31.5	
Effective Green, g (s)	25.4			31.5	
Actuated g/C Ratio	0.21			0.26	
Clearance Time (s)	5.0			5.0	
Vehicle Extension (s)	3.0			3.0	
Lane Grp Cap (vph)	256			639	
v/s Ratio Prot			0.20		
v/s Ratio Perm	0.07				
v/c Ratio	0.36		0.78		
Uniform Delay, d1	41.9		42.7		
Progression Factor	1.00		1.00		
Incremental Delay, d2	0.9		6.0		
Delay (s)	42.8		48.7		
Level of Service	D		D		
Approach Delay (s)	42.8				
Approach LOS	D				
Intersection Summary					

Timings  
200: Cameron St & Washington St

Synchro 9 Report  
02/19/2020



Lane Group	EBT	WBL	WBT	NBR	Ø1	Ø2	Ø4	Ø6	Ø9
Lane Configurations	↑↓		↑↓	↑					
Traffic Volume (vph)	1316	29	713	127					
Future Volume (vph)	1316	29	713	127					
Lane Group Flow (vph)	1541	0	798	240					
Turn Type	NA	custom	NA	Over					
Protected Phases	2 1	8	6 8	8	1	2	4	6	9
Permitted Phases					6	8			
Detector Phase	2 1	8	6 8	8					
Switch Phase									
Minimum Initial (s)		6.0		6.0	7.0	7.0	6.0	7.0	1.0
Minimum Split (s)		11.0		11.0	12.0	12.0	11.0	12.0	32.0
Total Split (s)		30.0		30.0	36.0	42.0	30.0	78.0	32.0
Total Split (%)		21.4%		21.4%	26%	30%	21%	56%	23%
Yellow Time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)		1.0		1.0	1.0	1.0	1.0	1.0	0.0
Lost Time Adjust (s)					0.0				
Total Lost Time (s)					5.0				
Lead/Lag					Lead	Lag			
Lead-Lag Optimize?					Yes	Yes			
Recall Mode		None		None	None	Min	None	Min	None
v/c Ratio	0.78		0.34	0.42					
Control Delay	11.9		3.8	2.6					
Queue Delay	3.9		0.0	0.0					
Total Delay	15.9		3.9	2.6					
Queue Length 50th (ft)	93		0	0					
Queue Length 95th (ft)	m276		148	0					
Internal Link Dist (ft)	238		106						
Turn Bay Length (ft)									
Base Capacity (vph)	1969		2360	570					
Starvation Cap Reductn	342		0	0					
Spillback Cap Reductn	0		90	0					
Storage Cap Reductn	0		0	0					
Reduced v/c Ratio	0.95		0.35	0.42					

#### Intersection Summary

Cycle Length: 140

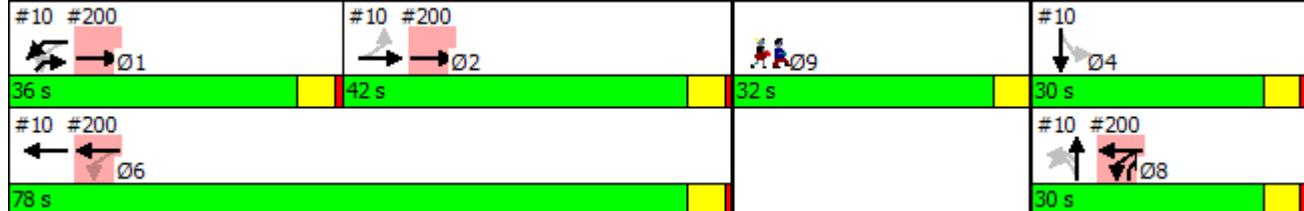
Actuated Cycle Length: 120.8

Natural Cycle: 110

Control Type: Actuated-Uncoordinated

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 200: Cameron St & Washington St



HCM Signalized Intersection Capacity Analysis  
200: Cameron St & Washington St

Synchro 9 Report  
02/19/2020



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↓			↑↓		↑
Traffic Volume (vph)	1316	24	29	713	0	127
Future Volume (vph)	1316	24	29	713	0	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0		5.0
Lane Util. Factor	0.95			0.95		1.00
Frpb, ped/bikes	1.00			1.00		1.00
Flpb, ped/bikes	1.00			1.00		1.00
Fr <sub>t</sub>	1.00			1.00		0.86
Flt Protected	1.00			1.00		1.00
Satd. Flow (prot)	3207			3212		1465
Flt Permitted	1.00			0.85		1.00
Satd. Flow (perm)	3207			2746		1465
Peak-hour factor, PHF	0.87	0.87	0.93	0.93	0.53	0.53
Adj. Flow (vph)	1513	28	31	767	0	240
RTOR Reduction (vph)	1	0	0	0	0	191
Lane Group Flow (vph)	1540	0	0	798	0	49
Confl. Peds. (#/hr)		14	14		18	2
Confl. Bikes (#/hr)		5				1
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Turn Type	NA	custom	NA		Over	
Protected Phases	2 1		8	6 8		8
Permitted Phases			6			8
Actuated Green, G (s)	74.2			99.6		25.4
Effective Green, g (s)	74.2			99.6		25.4
Actuated g/C Ratio	0.60			0.81		0.21
Clearance Time (s)					5.0	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)	1929			2314		301
v/s Ratio Prot	c0.48		c0.07		0.03	
v/s Ratio Perm			0.21			
v/c Ratio	0.80		0.34		0.16	
Uniform Delay, d1	18.8		3.2		40.2	
Progression Factor	0.48		1.00		1.00	
Incremental Delay, d2	1.0		0.1		0.3	
Delay (s)	10.1		3.2		40.5	
Level of Service	B		A		D	
Approach Delay (s)	10.1		3.2	40.5		
Approach LOS	B		A	D		
Intersection Summary						
HCM 2000 Control Delay	10.8			HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio	0.65					
Actuated Cycle Length (s)	123.3			Sum of lost time (s)		19.0
Intersection Capacity Utilization	58.6%			ICU Level of Service		B
Analysis Period (min)	15					
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis  
210: Library Lot & Washington St

Synchro 9 Report  
02/19/2020



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Traffic Volume (veh/h)	1431	12	12	742	0	14
Future Volume (Veh/h)	1431	12	12	742	0	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.83	0.90	0.90	0.54	0.54
Hourly flow rate (vph)	1724	14	13	824	0	26
Pedestrians	1				9	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	0				1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)	186			520		
pX, platoon unblocked			0.63		0.63	0.63
vC, conflicting volume			1747		2179	878
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1010		1660	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		100	96
cM capacity (veh/h)			434		55	682
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	1149	589	288	549	26	
Volume Left	0	0	13	0	0	
Volume Right	0	14	0	0	26	
cSH	1700	1700	434	1700	682	
Volume to Capacity	0.68	0.35	0.03	0.32	0.04	
Queue Length 95th (ft)	0	0	2	0	3	
Control Delay (s)	0.0	0.0	1.1	0.0	10.5	
Lane LOS			A		B	
Approach Delay (s)	0.0		0.4		10.5	
Approach LOS					B	
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			49.9%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
220: Grove St & Spring St

Synchro 9 Report  
02/19/2020



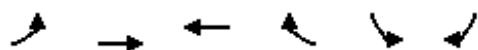
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	47	71	173	36	15	107
Future Volume (Veh/h)	47	71	173	36	15	107
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.57	0.57	0.77	0.77	0.67	0.67
Hourly flow rate (vph)	82	125	225	47	22	160
Pedestrians	16		4			13
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	1		0			1
Right turn flare (veh)						
Median type		None			None	
Median storage veh)						
Upstream signal (ft)					285	
pX, platoon unblocked						
vC, conflicting volume	472	278		288		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	472	278		288		
tC, single (s)	6.4	6.2		4.1		
tC, 2 stage (s)						
tF (s)	3.5	3.3		2.2		
p0 queue free %	85	83		98		
cM capacity (veh/h)	532	738		1268		
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	207	272	182			
Volume Left	82	0	22			
Volume Right	125	47	0			
cSH	640	1700	1268			
Volume to Capacity	0.32	0.16	0.02			
Queue Length 95th (ft)	35	0	1			
Control Delay (s)	13.3	0.0	1.1			
Lane LOS	B		A			
Approach Delay (s)	13.3	0.0	1.1			
Approach LOS	B					
Intersection Summary						
Average Delay		4.5				
Intersection Capacity Utilization		34.7%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (veh/h)	74	36	162	324	63	75
Future Volume (Veh/h)	74	36	162	324	63	75
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.72	0.72	0.85	0.85	0.92	0.92
Hourly flow rate (vph)	103	50	191	381	68	82
Pedestrians	7					12
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	1					1
Right turn flare (veh)						
Median type		None			None	
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	606	400			579	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	606	400			579	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	76	92			93	
cM capacity (veh/h)	428	644			974	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	153	572	150			
Volume Left	103	0	68			
Volume Right	50	381	0			
cSH	481	1700	974			
Volume to Capacity	0.32	0.34	0.07			
Queue Length 95th (ft)	34	0	6			
Control Delay (s)	15.9	0.0	4.4			
Lane LOS	C		A			
Approach Delay (s)	15.9	0.0	4.4			
Approach LOS	C					
Intersection Summary						
Average Delay		3.5				
Intersection Capacity Utilization		55.2%		ICU Level of Service		B
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
240: Hampden St & Cameron St

Synchro 9 Report  
02/19/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	127	204	174	132	4	13
Future Volume (Veh/h)	127	204	174	132	4	13
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.62	0.62	0.68	0.68	0.40	0.40
Hourly flow rate (vph)	205	329	256	194	10	33
Pedestrians		1	16		3	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	453			1111	357	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	453			1111	357	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	81			95	95	
cM capacity (veh/h)	1100			187	689	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	534	450	43			
Volume Left	205	0	10			
Volume Right	0	194	33			
cSH	1100	1700	424			
Volume to Capacity	0.19	0.26	0.10			
Queue Length 95th (ft)	17	0	8			
Control Delay (s)	4.7	0.0	14.4			
Lane LOS	A		B			
Approach Delay (s)	4.7	0.0	14.4			
Approach LOS			B			
Intersection Summary						
Average Delay		3.1				
Intersection Capacity Utilization		48.8%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
250: Brook St & Hampden St

Synchro 9 Report  
02/19/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	✗	✗	✗	✗	✗	✗
Traffic Volume (veh/h)	87	120	221	50	47	78
Future Volume (Veh/h)	87	120	221	50	47	78
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.78	0.78	0.67	0.67
Hourly flow rate (vph)	106	146	283	64	70	116
Pedestrians	9					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	1					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				1034		
pX, platoon unblocked						
vC, conflicting volume	767	137	195			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	767	137	195			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	64	84	79			
cM capacity (veh/h)	294	910	1374			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	252	347	186			
Volume Left	106	283	0			
Volume Right	146	0	116			
cSH	484	1374	1700			
Volume to Capacity	0.52	0.21	0.11			
Queue Length 95th (ft)	74	19	0			
Control Delay (s)	20.2	7.1	0.0			
Lane LOS	C	A				
Approach Delay (s)	20.2	7.1	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay		9.6				
Intersection Capacity Utilization		46.3%		ICU Level of Service		A
Analysis Period (min)		15				

## Timings 11: Wellesley Ave/Town Hall & Washington St

## Synchro 9 Report

02/19/2020



Lane Group	EBT	EBR	WBL	WBT	NBT	Ø4	Ø7	Ø9
Lane Configurations	4	4		4, 2	4			
Traffic Volume (vph)	683	760	87	321	0			
Future Volume (vph)	683	760	87	321	0			
Lane Group Flow (vph)	727	809	0	459	575			
Turn Type	NA	pm+ov	Perm	NA	NA			
Protected Phases	2	4	7		6	4	7	9
Permitted Phases	2	2		6	6			
Detector Phase	2	4	7	6	6	4	7	
Switch Phase								
Minimum Initial (s)	7.0		7.0	7.0		7.0	7.0	5.0
Minimum Split (s)	22.0		22.0	22.0		11.0	11.0	20.0
Total Split (s)	37.0		37.0	37.0		11.0	22.0	20.0
Total Split (%)	41.1%		41.1%	41.1%		12%	24%	22%
Yellow Time (s)	3.0		3.0	3.0		3.0	3.0	2.0
All-Red Time (s)	1.0		1.0	1.0		1.0	1.0	0.0
Lost Time Adjust (s)	0.0			0.0				
Total Lost Time (s)	4.0			4.0				
Lead/Lag					Lag	Lead		
Lead-Lag Optimize?					Yes	Yes		
Recall Mode	Min		Min	Min		None	None	None
v/c Ratio	0.96	0.58		1.08dl	0.93			
Control Delay	48.0	2.1		20.5	47.7			
Queue Delay	0.0	0.7		0.0	0.0			
Total Delay	48.0	2.8		20.5	47.7			
Queue Length 50th (ft)	277	0		70	226			
Queue Length 95th (ft)	#717	27		173	#559			
Internal Link Dist (ft)	440			812	7			
Turn Bay Length (ft)								
Base Capacity (vph)	755	1392		784	616			
Starvation Cap Reductn	0	4		0	0			
Spillback Cap Reductn	0	279		0	0			
Storage Cap Reductn	0	0		0	0			
Reduced v/c Ratio	0.96	0.73		0.59	0.93			

## Intersection Summary

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Cycle Length: 90

Actuated Cycle Length: 74

Natural Cycle: 130

## Control Type: Actuated-Uncoordinated

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

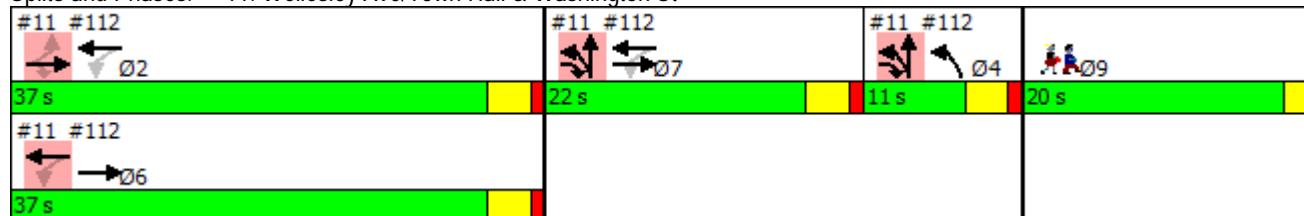
Splits and Phases: 11: Wellesley Ave/Town Hall & Washington

#11 #112

Ø2

37 s  22 s

**#11 #11z**



HCM Signalized Intersection Capacity Analysis  
11: Wellesley Ave/Town Hall & Washington St

Synchro 9 Report  
02/19/2020

Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	683	760	87	321	0	453	0	53	0	0	0
Future Volume (vph)	0	683	760	87	321	0	453	0	53	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0			4.0				
Lane Util. Factor	1.00	1.00		0.95			1.00					
Frpb, ped/bikes	1.00	1.00		1.00			1.00					
Flpb, ped/bikes	1.00	1.00		1.00			1.00					
Fr <sub>t</sub>	1.00	0.85		1.00			0.99					
Flt Protected	1.00	1.00		0.99			0.96					
Satd. Flow (prot)	1676	1425		3087			1558					
Flt Permitted	1.00	1.00		0.56			0.96					
Satd. Flow (perm)	1676	1425		1741			1558					
Peak-hour factor, PHF	0.94	0.94	0.94	0.89	0.89	0.89	0.88	0.88	0.88	0.92	0.92	0.92
Adj. Flow (vph)	0	727	809	98	361	0	515	0	60	0	0	0
RTOR Reduction (vph)	0	0	139	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	727	670	0	459	0	0	575	0	0	0	0
Confl. Peds. (#/hr)	1				1							
Heavy Vehicles (%)	0%	2%	2%	1%	5%	0%	4%	0%	0%	0%	0%	0%
Turn Type	NA	pm+ov	Perm	NA		Split	NA					
Protected Phases	2	4	7		6		4	7	4	7		
Permitted Phases	2	2	2	6	6							
Actuated Green, G (s)	33.3	62.6		33.3			29.3					
Effective Green, g (s)	33.3	62.6		33.3			29.3					
Actuated g/C Ratio	0.44	0.83		0.44			0.39					
Clearance Time (s)	4.0			4.0								
Vehicle Extension (s)	3.0			3.0								
Lane Grp Cap (vph)	738	1255		766			603					
v/s Ratio Prot	c0.43	0.21					c0.37					
v/s Ratio Perm		0.26		0.26								
v/c Ratio	0.99	0.53		1.08dl			0.95					
Uniform Delay, d1	20.9	2.0		16.1			22.5					
Progression Factor	1.00	1.00		1.00			1.06					
Incremental Delay, d2	29.2	0.4		1.3			24.1					
Delay (s)	50.1	2.4		17.3			48.0					
Level of Service	D	A		B			D					
Approach Delay (s)	25.0			17.3			48.0			0.0		
Approach LOS	C			B			D			A		
<b>Intersection Summary</b>												
HCM 2000 Control Delay	28.8			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.99											
Actuated Cycle Length (s)	75.6			Sum of lost time (s)			14.0					
Intersection Capacity Utilization	94.1%			ICU Level of Service			F					
Analysis Period (min)	15											
dl	Defacto Left Lane. Recode with 1 though lane as a left lane.											
c	Critical Lane Group											

## Timings

## Synchro 9 Report

02/19/2020

10: Washington St &amp; Grove St &amp; Central St



Lane Group	EBL	EBT	WBL2	WBL	WBT	NBL2	NBL	NBT	SBL	SBT	NER	Ø9
Lane Configurations												
Traffic Volume (vph)	1	423	5	342	501	11	150	16	34	10	240	
Future Volume (vph)	1	423	5	342	501	11	150	16	34	10	240	
Lane Group Flow (vph)	0	632	0	386	589	0	0	261	0	76	264	
Turn Type	Perm	NA	custom	Prot	NA	Perm	Perm	NA	Perm	NA	Over	
Protected Phases		2			1	6			8		4	9
Permitted Phases	2						8	8		4		
Detector Phase	2	2	1	1	6	8	8	8	4	4	1	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	6.0	6.0	6.0	6.0	6.0	7.0	1.0
Minimum Split (s)	12.0	12.0	20.0	20.0	12.0	11.0	11.0	11.0	11.0	11.0	20.0	32.0
Total Split (s)	30.0	30.0	32.0	32.0	62.0	18.0	18.0	18.0	18.0	18.0	32.0	32.0
Total Split (%)	26.8%	26.8%	28.6%	28.6%	55.4%	16.1%	16.1%	16.1%	16.1%	16.1%	28.6%	29%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lost Time Adjust (s)	0.0				0.0			0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0			5.0		5.0	5.0	
Lead/Lag	Lag	Lag	Lead	Lead							Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes							Yes	
Recall Mode	Min	Min	None	None	Min	None	None	None	None	None	None	None
v/c Ratio	0.79		5.44	0.56				1.45		0.41	0.35	
Control Delay	42.3		2041.3	10.3				263.4		48.5	30.2	
Queue Delay	0.0		0.0	0.3				0.0		0.0	0.0	
Total Delay	42.3		2041.3	10.7				263.4		48.5	30.2	
Queue Length 50th (ft)	144		~370	102				~168		34	54	
Queue Length 95th (ft)	#362		#733	442				#422		95	136	
Internal Link Dist (ft)	525			238				205		238		
Turn Bay Length (ft)											100	
Base Capacity (vph)	795		71	1060				180		187	764	
Starvation Cap Reductn	0		0	118				0		0	0	
Spillback Cap Reductn	0		0	0				0		0	0	
Storage Cap Reductn	0		0	0				0		0	0	
Reduced v/c Ratio	0.79		5.44	0.63				1.45		0.41	0.35	

## Intersection Summary

Cycle Length: 112

Actuated Cycle Length: 92.8

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

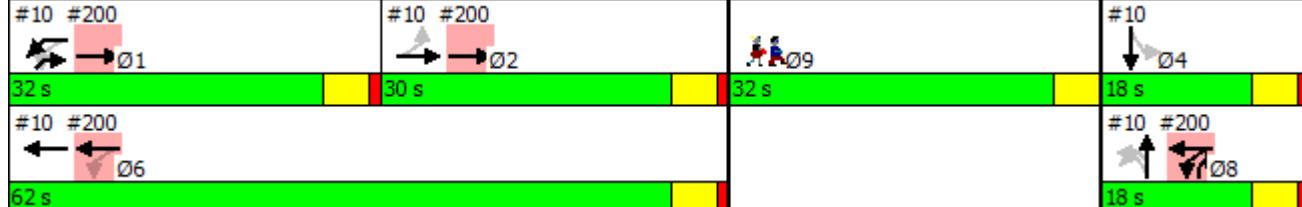
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 10: Washington St &amp; Grove St &amp; Central St



HCM Signalized Intersection Capacity Analysis  
10: Washington St & Grove St & Central St

Synchro 9 Report  
02/19/2020

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR
Lane Configurations												
Traffic Volume (vph)	1	423	134	30	5	342	501	29	11	150	16	47
Future Volume (vph)	1	423	134	30	5	342	501	29	11	150	16	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	-4%						0%				0%	
Total Lost time (s)	5.0					5.0	5.0				5.0	
Lane Util. Factor	0.95					1.00	1.00				1.00	
Frpb, ped/bikes	0.96					1.00	1.00				0.99	
Flpb, ped/bikes	1.00					0.98	1.00				0.99	
Fr	0.96					1.00	0.99				0.97	
Flt Protected	1.00					0.95	1.00				0.97	
Satd. Flow (prot)	3024					1580	1678				1564	
Flt Permitted	0.95					0.14	1.00				0.78	
Satd. Flow (perm)	2886					240	1678				1256	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.90	0.90	0.90	0.90	0.86	0.86	0.86	0.86
Adj. Flow (vph)	1	455	144	32	6	380	557	32	13	174	19	55
RTOR Reduction (vph)	0	3	0	0	0	0	2	0	0	0	0	0
Lane Group Flow (vph)	0	629	0	0	0	386	587	0	0	0	261	0
Confl. Peds. (#/hr)	8		33	33	33	33		8		9		11
Confl. Bikes (#/hr)												
Heavy Vehicles (%)	0%	1%	1%	0%	25%	0%	1%	0%	0%	1%	0%	0%
Turn Type	Perm	NA		custom	Prot	NA		Perm	Perm	NA		
Protected Phases		2				1	6				8	
Permitted Phases	2			1				8	8			
Actuated Green, G (s)	25.9				27.7	58.6					13.4	
Effective Green, g (s)	25.9				27.7	58.6					13.4	
Actuated g/C Ratio	0.27				0.29	0.61					0.14	
Clearance Time (s)	5.0				5.0	5.0					5.0	
Vehicle Extension (s)	3.0				3.0	3.0					3.0	
Lane Grp Cap (vph)	784				69	1031					176	
v/s Ratio Prot					0.35							
v/s Ratio Perm	c0.22				c1.61						c0.21	
v/c Ratio	0.80				5.59	0.57					1.48	
Uniform Delay, d1	32.3				33.8	10.9					40.9	
Progression Factor	1.00				0.88	0.60					1.00	
Incremental Delay, d2	5.9				2095.9	0.7					245.2	
Delay (s)	38.3				2125.7	7.2					286.1	
Level of Service	D				F	A					F	
Approach Delay (s)	38.3					845.9					286.1	
Approach LOS	D					F					F	
Intersection Summary												
HCM 2000 Control Delay	422.9			HCM 2000 Level of Service				F				
HCM 2000 Volume to Capacity ratio	2.54											
Actuated Cycle Length (s)	95.3			Sum of lost time (s)				19.0				
Intersection Capacity Utilization	98.0%			ICU Level of Service				F				
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
10: Washington St & Grove St & Central St

Synchro 9 Report  
02/19/2020



Movement	SBL	SBT	SBR	SBR2	NER
Lane Configurations					
Traffic Volume (vph)	34	10	15	5	240
Future Volume (vph)	34	10	15	5	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Grade (%)	-2%				
Total Lost time (s)	5.0				5.0
Lane Util. Factor	1.00				0.88
Frpb, ped/bikes	0.97				1.00
Flpb, ped/bikes	1.00				1.00
Fr <sub>t</sub>	0.96				0.85
Flt Protected	0.97				1.00
Satd. Flow (prot)	1529				2558
Flt Permitted	0.83				1.00
Satd. Flow (perm)	1308				2558
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.91
Adj. Flow (vph)	40	12	18	6	264
RTOR Reduction (vph)	0	0	0	0	0
Lane Group Flow (vph)	0	76	0	0	264
Confl. Peds. (#/hr)	11		33	9	11
Confl. Bikes (#/hr)					1
Heavy Vehicles (%)	3%	0%	0%	0%	0%
Turn Type	Perm	NA			Over
Protected Phases		4			1
Permitted Phases		4			
Actuated Green, G (s)	13.4				27.7
Effective Green, g (s)	13.4				27.7
Actuated g/C Ratio	0.14				0.29
Clearance Time (s)	5.0				5.0
Vehicle Extension (s)	3.0				3.0
Lane Grp Cap (vph)	183				743
v/s Ratio Prot					0.10
v/s Ratio Perm	0.06				
v/c Ratio	0.42				0.36
Uniform Delay, d1	37.4				26.7
Progression Factor	1.00				1.00
Incremental Delay, d2	1.5				0.3
Delay (s)	38.9				27.0
Level of Service	D				C
Approach Delay (s)	38.9				
Approach LOS	D				
Intersection Summary					



Lane Group	EBT	WBL	WBT	NBR	Ø1	Ø2	Ø4	Ø6	Ø9
Lane Configurations	↑↓		↑↓	↑					
Traffic Volume (vph)	708	45	878	144					
Future Volume (vph)	708	45	878	144					
Lane Group Flow (vph)	767	0	1003	195					
Turn Type	NA	custom	NA	Over					
Protected Phases	2 1	8	6 8	8	1	2	4	6	9
Permitted Phases					6	8			
Detector Phase	2 1	8	6 8	8					
Switch Phase									
Minimum Initial (s)		6.0		6.0	7.0	7.0	6.0	7.0	1.0
Minimum Split (s)		11.0		11.0	20.0	12.0	11.0	12.0	32.0
Total Split (s)		18.0		18.0	32.0	30.0	18.0	62.0	32.0
Total Split (%)		16.1%		16.1%	29%	27%	16%	55%	29%
Yellow Time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)		1.0		1.0	1.0	1.0	1.0	1.0	0.0
Lost Time Adjust (s)					0.0				
Total Lost Time (s)					5.0				
Lead/Lag					Lead	Lag			
Lead-Lag Optimize?					Yes	Yes			
Recall Mode		None		None	None	Min	None	Min	None
v/c Ratio	0.38		0.44	0.32					
Control Delay	6.1		6.0	1.4					
Queue Delay	0.4		0.0	0.0					
Total Delay	6.5		6.1	1.4					
Queue Length 50th (ft)	30		0	0					
Queue Length 95th (ft)	m100		207	0					
Internal Link Dist (ft)	238		106						
Turn Bay Length (ft)									
Base Capacity (vph)	2013		2258	612					
Starvation Cap Reductn	689		0	0					
Spillback Cap Reductn	0		49	0					
Storage Cap Reductn	0		0	0					
Reduced v/c Ratio	0.58		0.45	0.32					

#### Intersection Summary

Cycle Length: 112

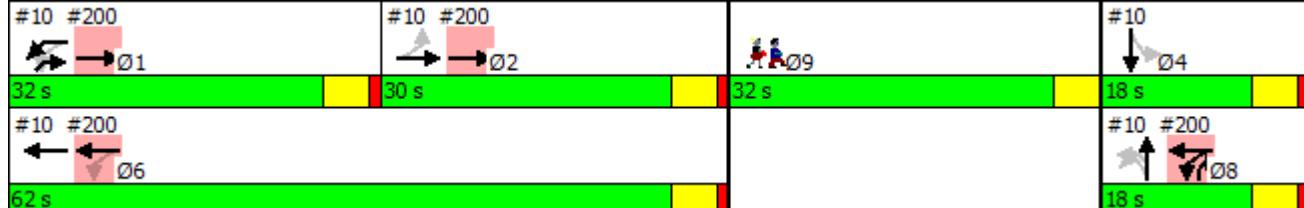
Actuated Cycle Length: 92.8

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 200: Cameron St & Washington St



HCM Signalized Intersection Capacity Analysis  
200: Cameron St & Washington St

Synchro 9 Report  
02/19/2020



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Traffic Volume (vph)	708	36	45	878	0	144
Future Volume (vph)	708	36	45	878	0	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0		5.0
Lane Util. Factor	0.95			0.95		1.00
Frpb, ped/bikes	1.00			1.00		1.00
Flpb, ped/bikes	1.00			1.00		1.00
Fr <sub>t</sub>	0.99			1.00		0.86
Flt Protected	1.00			1.00		1.00
Satd. Flow (prot)	3187			3209		1450
Flt Permitted	1.00			0.89		1.00
Satd. Flow (perm)	3187			2848		1450
Peak-hour factor, PHF	0.97	0.97	0.92	0.92	0.74	0.74
Adj. Flow (vph)	730	37	49	954	0	195
RTOR Reduction (vph)	3	0	0	0	0	168
Lane Group Flow (vph)	764	0	0	1003	0	27
Confl. Peds. (#/hr)		35	35		41	
Confl. Bikes (#/hr)		4				
Heavy Vehicles (%)	1%	0%	0%	1%	0%	2%
Turn Type	NA	custom	NA		Over	
Protected Phases	2 1		8	6 8		8
Permitted Phases			6			8
Actuated Green, G (s)	58.6			72.0		13.4
Effective Green, g (s)	58.6			72.0		13.4
Actuated g/C Ratio	0.61			0.76		0.14
Clearance Time (s)					5.0	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)	1959			2202		203
v/s Ratio Prot	0.24		c0.06		0.02	
v/s Ratio Perm			c0.28			
v/c Ratio	0.39		0.46		0.14	
Uniform Delay, d1	9.3		4.3		35.9	
Progression Factor	0.52			1.00		1.00
Incremental Delay, d2	0.1			0.2		0.3
Delay (s)	4.9			4.5		36.2
Level of Service	A		A		D	
Approach Delay (s)	4.9			4.5	36.2	
Approach LOS	A			A	D	
<b>Intersection Summary</b>						
HCM 2000 Control Delay	7.8		HCM 2000 Level of Service		A	
HCM 2000 Volume to Capacity ratio	0.43					
Actuated Cycle Length (s)	95.3		Sum of lost time (s)		19.0	
Intersection Capacity Utilization	59.9%		ICU Level of Service		B	
Analysis Period (min)	15					
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis  
210: Library Lot & Washington St

Synchro 9 Report  
02/19/2020



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Traffic Volume (veh/h)	831	25	31	924	0	51
Future Volume (Veh/h)	831	25	31	924	0	51
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.92	0.92	0.73	0.73
Hourly flow rate (vph)	913	27	34	1004	0	70
Pedestrians	2			1	26	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	2	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)	186			520		
pX, platoon unblocked			0.89		0.93	0.89
vC, conflicting volume			966		1524	497
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			704		954	174
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		100	90
cM capacity (veh/h)			783		227	732
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	609	331	369	669	70	
Volume Left	0	0	34	0	0	
Volume Right	0	27	0	0	70	
cSH	1700	1700	783	1700	732	
Volume to Capacity	0.36	0.19	0.04	0.39	0.10	
Queue Length 95th (ft)	0	0	3	0	8	
Control Delay (s)	0.0	0.0	1.4	0.0	10.4	
Lane LOS			A		B	
Approach Delay (s)	0.0		0.5		10.4	
Approach LOS				B		
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			58.4%		ICU Level of Service	B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
220: Grove St & Spring St

Synchro 9 Report  
02/19/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (veh/h)	82	95	128	19	11	142
Future Volume (Veh/h)	82	95	128	19	11	142
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.65	0.65	0.79	0.79	0.94	0.94
Hourly flow rate (vph)	126	146	162	24	12	151
Pedestrians	10		3			12
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	1		0			1
Right turn flare (veh)						
Median type		None			None	
Median storage veh)						
Upstream signal (ft)					285	
pX, platoon unblocked						
vC, conflicting volume	362	196		196		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	362	196		196		
tC, single (s)	6.4	6.2		4.1		
tC, 2 stage (s)						
tF (s)	3.5	3.3		2.2		
p0 queue free %	80	82		99		
cM capacity (veh/h)	623	832		1377		
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	272	186	163			
Volume Left	126	0	12			
Volume Right	146	24	0			
cSH	720	1700	1377			
Volume to Capacity	0.38	0.11	0.01			
Queue Length 95th (ft)	44	0	1			
Control Delay (s)	13.0	0.0	0.6			
Lane LOS	B		A			
Approach Delay (s)	13.0	0.0	0.6			
Approach LOS	B					
Intersection Summary						
Average Delay		5.9				
Intersection Capacity Utilization		35.0%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
230: Grove St & Hampden St

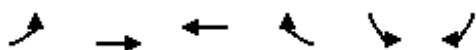
Synchro 9 Report  
02/19/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (veh/h)	126	40	102	84	41	170
Future Volume (Veh/h)	126	40	102	84	41	170
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.75	0.75	0.92	0.92	0.75	0.75
Hourly flow rate (vph)	168	53	111	91	55	227
Pedestrians	2				13	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	0				1	
Right turn flare (veh)						
Median type		None			None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	496	172			204	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	496	172			204	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	67	94			96	
cM capacity (veh/h)	515	859			1377	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	221	202	282			
Volume Left	168	0	55			
Volume Right	53	91	0			
cSH	570	1700	1377			
Volume to Capacity	0.39	0.12	0.04			
Queue Length 95th (ft)	46	0	3			
Control Delay (s)	15.3	0.0	1.8			
Lane LOS	C	A				
Approach Delay (s)	15.3	0.0	1.8			
Approach LOS	C					
Intersection Summary						
Average Delay		5.5				
Intersection Capacity Utilization		43.0%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
240: Hampden St & Cameron St

Synchro 9 Report  
02/19/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	70	51	142	103	2	8
Future Volume (Veh/h)	70	51	142	103	2	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.67	0.67	0.88	0.88	0.56	0.56
Hourly flow rate (vph)	104	76	161	117	4	14
Pedestrians		1	15		5	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	283			524	226	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	283			524	226	
tC, single (s)	4.1			6.4	6.3	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.4	
p0 queue free %	92			99	98	
cM capacity (veh/h)	1274			467	781	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	180	278	18			
Volume Left	104	0	4			
Volume Right	0	117	14			
cSH	1274	1700	680			
Volume to Capacity	0.08	0.16	0.03			
Queue Length 95th (ft)	7	0	2			
Control Delay (s)	5.0	0.0	10.4			
Lane LOS	A		B			
Approach Delay (s)	5.0	0.0	10.4			
Approach LOS			B			
Intersection Summary						
Average Delay		2.3				
Intersection Capacity Utilization		34.2%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
250: Brook St & Hampden St

Synchro 9 Report  
02/19/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	17	34	171	26	52	55
Future Volume (Veh/h)	17	34	171	26	52	55
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.69	0.69	0.88	0.88	0.92	0.92
Hourly flow rate (vph)	25	49	194	30	57	60
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				1034		
pX, platoon unblocked						
vC, conflicting volume	505	87	117			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	505	87	117			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	95	87			
cM capacity (veh/h)	461	977	1484			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	74	224	117			
Volume Left	25	194	0			
Volume Right	49	0	60			
cSH	709	1484	1700			
Volume to Capacity	0.10	0.13	0.07			
Queue Length 95th (ft)	9	11	0			
Control Delay (s)	10.7	6.9	0.0			
Lane LOS	B	A				
Approach Delay (s)	10.7	6.9	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay		5.6				
Intersection Capacity Utilization		27.5%		ICU Level of Service		A
Analysis Period (min)		15				

Timings  
11: Wellesley Ave/Town Hall & Washington St

Synchro 9 Report  
02/19/2020



Lane Group	EBT	EBR	WBL	WBT	NBT	Ø4	Ø7	Ø9
Lane Configurations	4	1		4	4			
Traffic Volume (vph)	386	482	130	505	0			
Future Volume (vph)	386	482	130	505	0			
Lane Group Flow (vph)	398	497	0	690	556			
Turn Type	NA	pm+ov	pm+pt	NA	NA			
Protected Phases	2	4 7	1	6	4 7	4	7	9
Permitted Phases	2	2	6	6 1				
Detector Phase	2	4 7	1	6	4 7			
Switch Phase								
Minimum Initial (s)	7.0		6.0	7.0		7.0	7.0	5.0
Minimum Split (s)	11.0		10.0	11.0		11.0	11.0	20.0
Total Split (s)	33.0		10.0	43.0		26.0	11.0	20.0
Total Split (%)	33.0%		10.0%	43.0%		26%	11%	20%
Yellow Time (s)	3.0		3.0	3.0		3.0	3.0	2.0
All-Red Time (s)	1.0		1.0	1.0		1.0	1.0	0.0
Lost Time Adjust (s)	0.0			0.0				
Total Lost Time (s)	4.0			4.0				
Lead/Lag	Lag		Lead			Lag	Lead	
Lead-Lag Optimize?	Yes		Yes			Yes	Yes	
Recall Mode	Min		None	Min		None	None	None
v/c Ratio	0.72	0.41		0.72	0.87			
Control Delay	34.0	1.5		23.5	48.3			
Queue Delay	0.0	0.6		0.0	0.0			
Total Delay	34.0	2.2		23.5	48.3			
Queue Length 50th (ft)	163	0		113	305			
Queue Length 95th (ft)	#388	32		#251	#625			
Internal Link Dist (ft)	440			812	7			
Turn Bay Length (ft)								
Base Capacity (vph)	609	1226		1018	642			
Starvation Cap Reductn	0	0		0	0			
Spillback Cap Reductn	0	392		0	0			
Storage Cap Reductn	0	0		0	0			
Reduced v/c Ratio	0.65	0.60		0.68	0.87			

#### Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 81.7

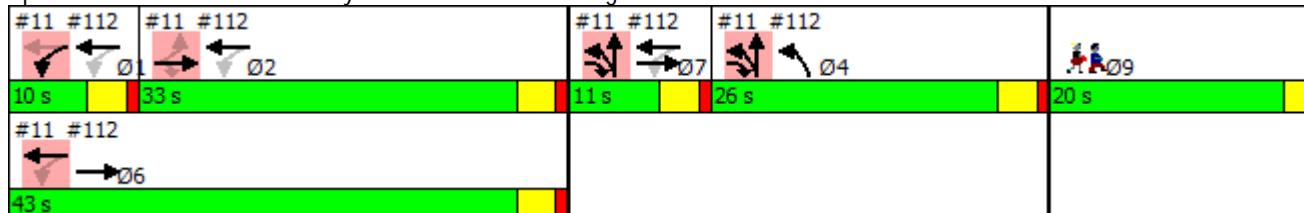
Natural Cycle: 90

Control Type: Actuated-Uncoordinated

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 11: Wellesley Ave/Town Hall & Washington St



HCM Signalized Intersection Capacity Analysis  
11: Wellesley Ave/Town Hall & Washington St

Synchro 9 Report  
02/19/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	386	482	130	505	0	486	0	53	0	0	0
Future Volume (vph)	0	386	482	130	505	0	486	0	53	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0			4.0				
Lane Util. Factor	1.00	1.00		0.95			1.00					
Frpb, ped/bikes	1.00	1.00		1.00			1.00					
Flpb, ped/bikes	1.00	1.00		1.00			1.00					
Fr <sub>t</sub>	1.00	0.85		1.00			0.99					
Flt Protected	1.00	1.00		0.99			0.96					
Satd. Flow (prot)	1693	1425		3153			1569					
Flt Permitted	1.00	1.00		0.60			0.96					
Satd. Flow (perm)	1693	1425		1916			1569					
Peak-hour factor, PHF	0.97	0.97	0.97	0.92	0.92	0.92	0.97	0.97	0.97	0.92	0.92	0.92
Adj. Flow (vph)	0	398	497	141	549	0	501	0	55	0	0	0
RTOR Reduction (vph)	0	0	137	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	398	360	0	690	0	0	556	0	0	0	0
Confl. Peds. (#/hr)	2				2	2						
Heavy Vehicles (%)	0%	1%	2%	2%	2%	0%	3%	0%	2%	0%	0%	0%
Turn Type	NA	pm+ov	pm+pt	NA			Split	NA				
Protected Phases	2	4	7	1	6		4	7	4	7		
Permitted Phases	2	2	2	6	6	1						
Actuated Green, G (s)	26.8	60.2		36.9			33.4					
Effective Green, g (s)	26.8	60.2		36.9			33.4					
Actuated g/C Ratio	0.32	0.72		0.44			0.40					
Clearance Time (s)	4.0			4.0								
Vehicle Extension (s)	3.0			3.0								
Lane Grp Cap (vph)	545	1099		940			629					
v/s Ratio Prot	0.24	0.13		c0.05			c0.35					
v/s Ratio Perm		0.12		c0.27								
v/c Ratio	0.73	0.33		0.73			0.88					
Uniform Delay, d1	25.0	4.2		19.1			23.1					
Progression Factor	1.00	1.00		1.00			1.44					
Incremental Delay, d2	5.0	0.2		3.0			12.9					
Delay (s)	30.0	4.3		22.1			46.2					
Level of Service	C	A		C			D					
Approach Delay (s)	15.7			22.1			46.2			0.0		
Approach LOS	B			C			D			A		
<b>Intersection Summary</b>												
HCM 2000 Control Delay	25.7			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.86											
Actuated Cycle Length (s)	83.2			Sum of lost time (s)			18.0					
Intersection Capacity Utilization	85.8%			ICU Level of Service			E					
Analysis Period (min)	15											
c Critical Lane Group												

## APPENDIX C

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- Parking Survey

Time Cap. (spaces)	1	2	3	4	5	6	7	8	9	
	Cameron St Lot	Library Lot	Main Hunnewell Lot	Front Circle Parking	Library Side Lot	Hunnewell Side Lot	Library Garage	Cameron St.	Spring St.	Private Parking Lot
	137	64	28	8	18	5	53	35	6	
07:00	6	4%	4	6%	2	7%	0	0%	4	67% No Extra Activity
07:30	9	7%	11	17%	4	14%	2	11%	0	0% No Extra Activity
08:00	20	15%	15	23%	21	75%	3	17%	4	11% No Extra Activity
08:30	25	18%	17	27%	22	79%	8	100%	5	67% No Extra Activity
09:00	57	42%	33	52%	22	79%	8	100%	7	More cars from usual traffic
09:30	70	51%	54	84%	21	75%	8	100%	11	More cars from usual traffic
10:00	79	58%	65	102%	22	79%	8	100%	18	More cars from usual traffic
10:30	98	72%	67	105%	24	86%	8	100%	18	More cars from usual traffic
11:00	104	76%	70	109%	23	82%	8	100%	18	More cars from usual traffic
11:30	105	77%	68	106%	25	89%	8	100%	18	More cars from usual traffic
12:00	104	76%	59	92%	25	89%	8	100%	18	No apparent Change
12:30	110	80%	56	88%	25	89%	8	100%	18	No apparent Change
13:00	112	82%	63	98%	25	89%	6	75%	17	No apparent Change
13:30	115	84%	51	80%	24	86%	5	63%	18	No apparent Change
14:00	103	75%	62	97%	23	82%	4	50%	18	No apparent Change
14:30	100	73%	60	94%	23	82%	4	50%	15	No apparent Change
										At least 10 parents using this lot to pick up school children
15:00	117	85%	54	84%	26	93%	4	50%	16	89% 100% 6 100% Up school children
15:30	85	62%	47	73%	16	57%	2	25%	10	56% 1 3% 4 67% No Extra Activity
16:00	77	56%	61	95%	9	32%	0	0%	9	50% 1 20% 50 94% 1 3% 3 50% No Extra Activity
16:30	70	51%	56	88%	4	14%	0	0%	11	61% 0 0% 52 98% 0 0% 3 50% No Extra Activity
17:00	61	45%	46	72%	3	11%	0	0%	10	56% 1 20% 49 92% 0 0% 3 50% No Extra Activity
17:30	44	32%	26	41%	1	4%	0	0%	5	28% 1 20% 31 58% 0 0% 6 100% No Extra Activity
18:00	42	31%	19	30%	1	4%	0	0%	4	22% 1 20% 21 40% 0 0% 6 100% No Extra Activity

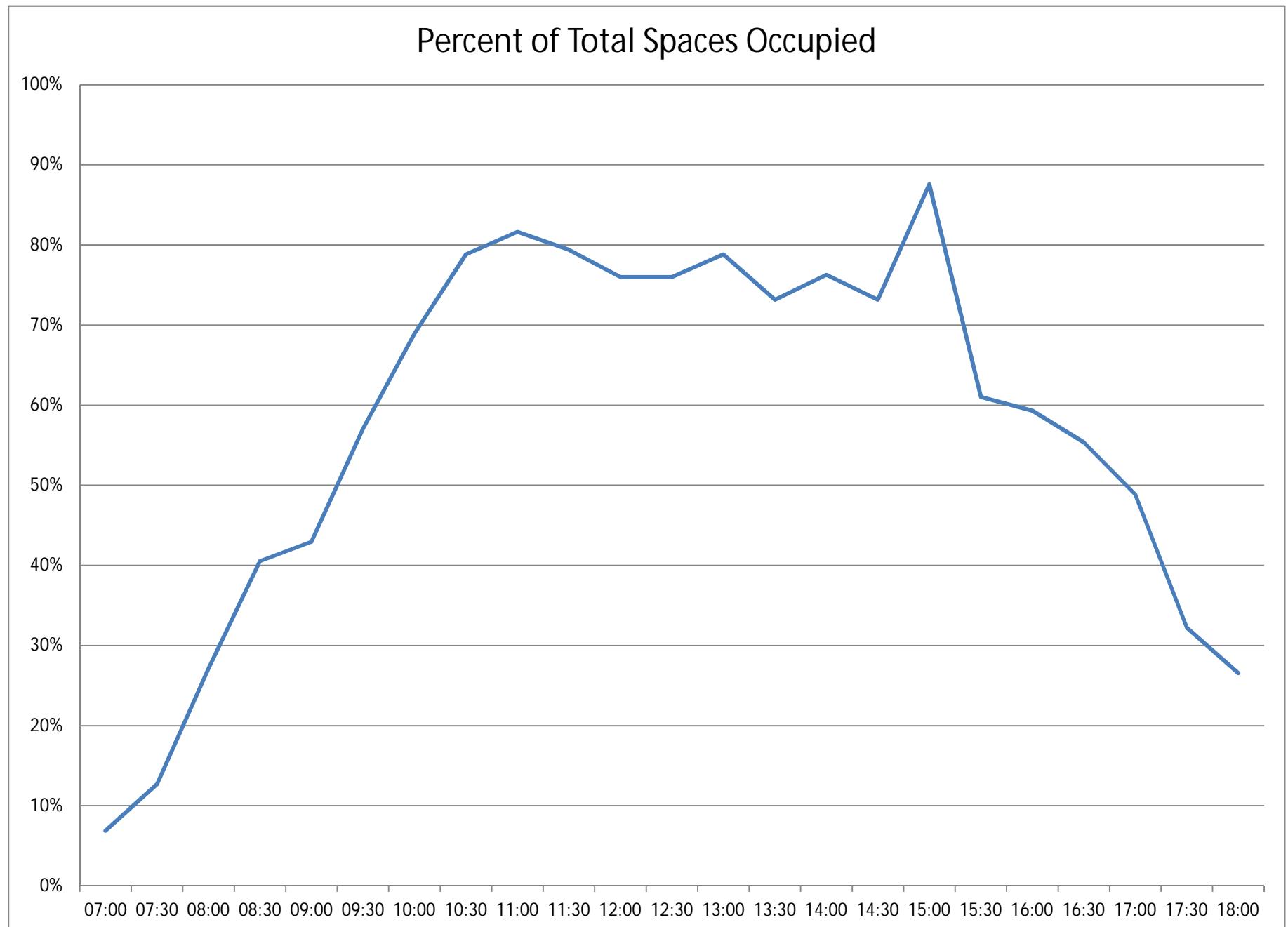
2 Cars parked in Library Circle in front of garage door all day

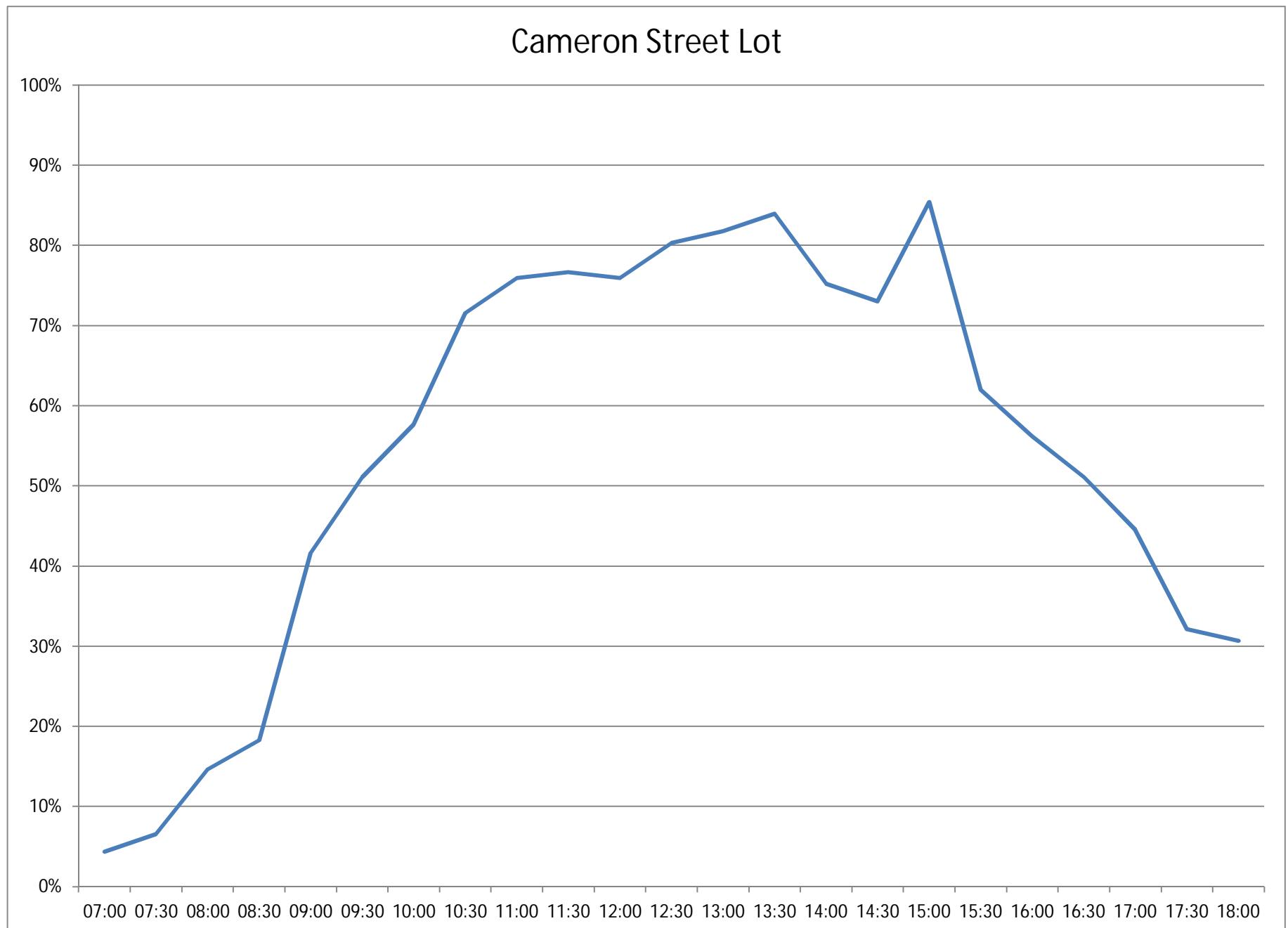
The only parking space that remained open was a reserved space

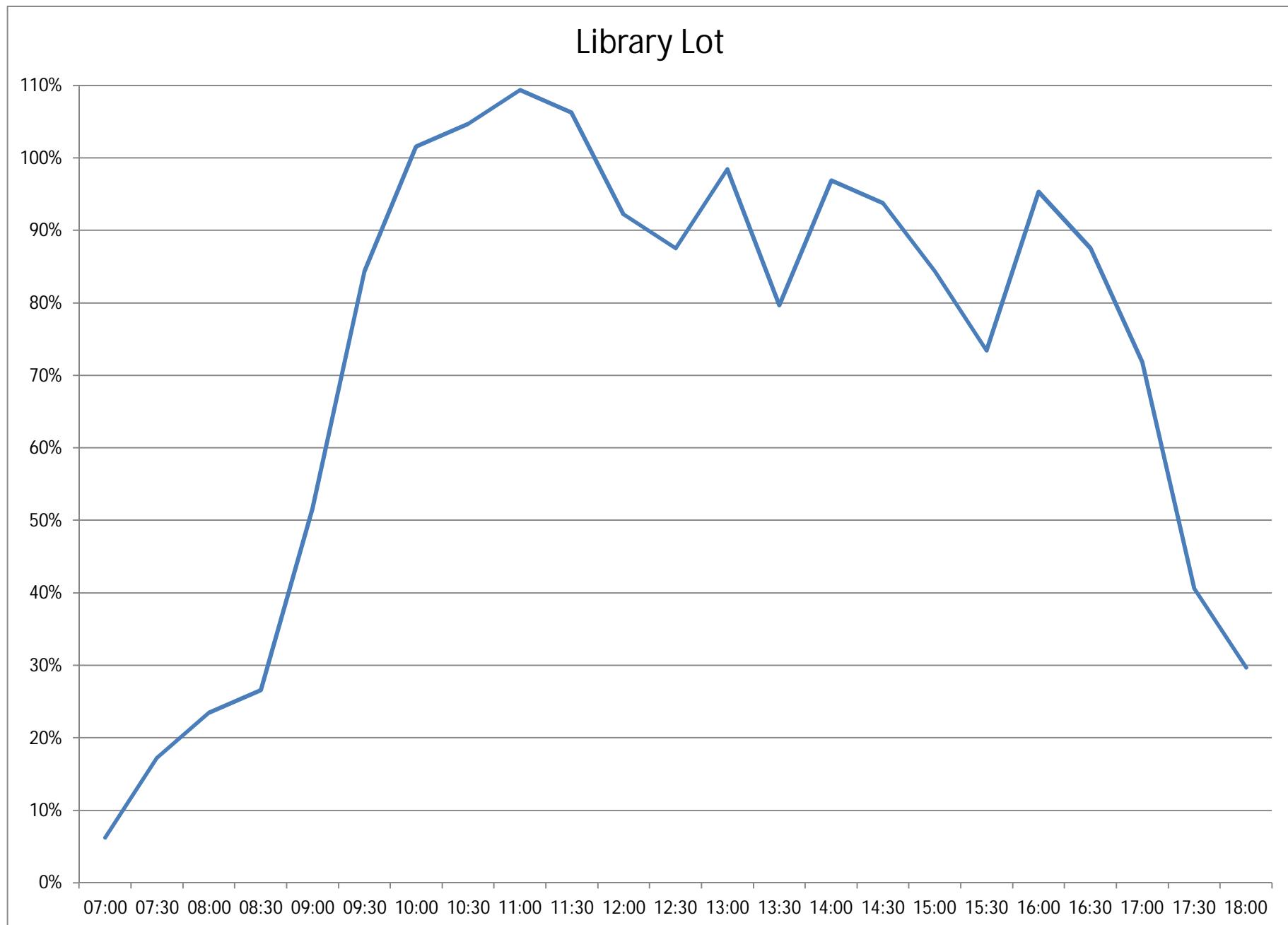
At the 3 peaks the only spaces open were handicapped spaces

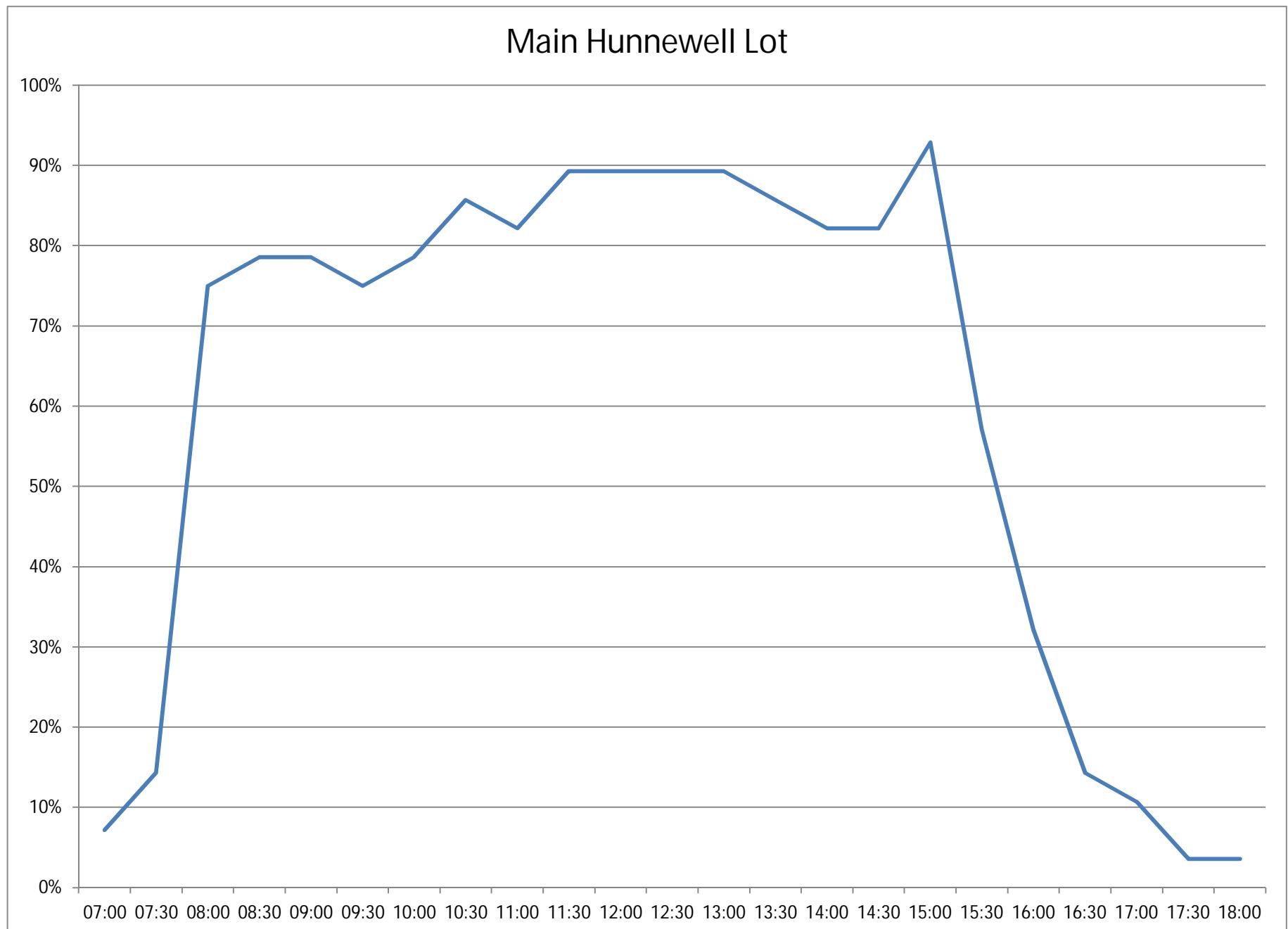
At peak, there were also 3 busses waiting outside the school. There were also 3 cars parked in Neighboring Dana Hall Lot

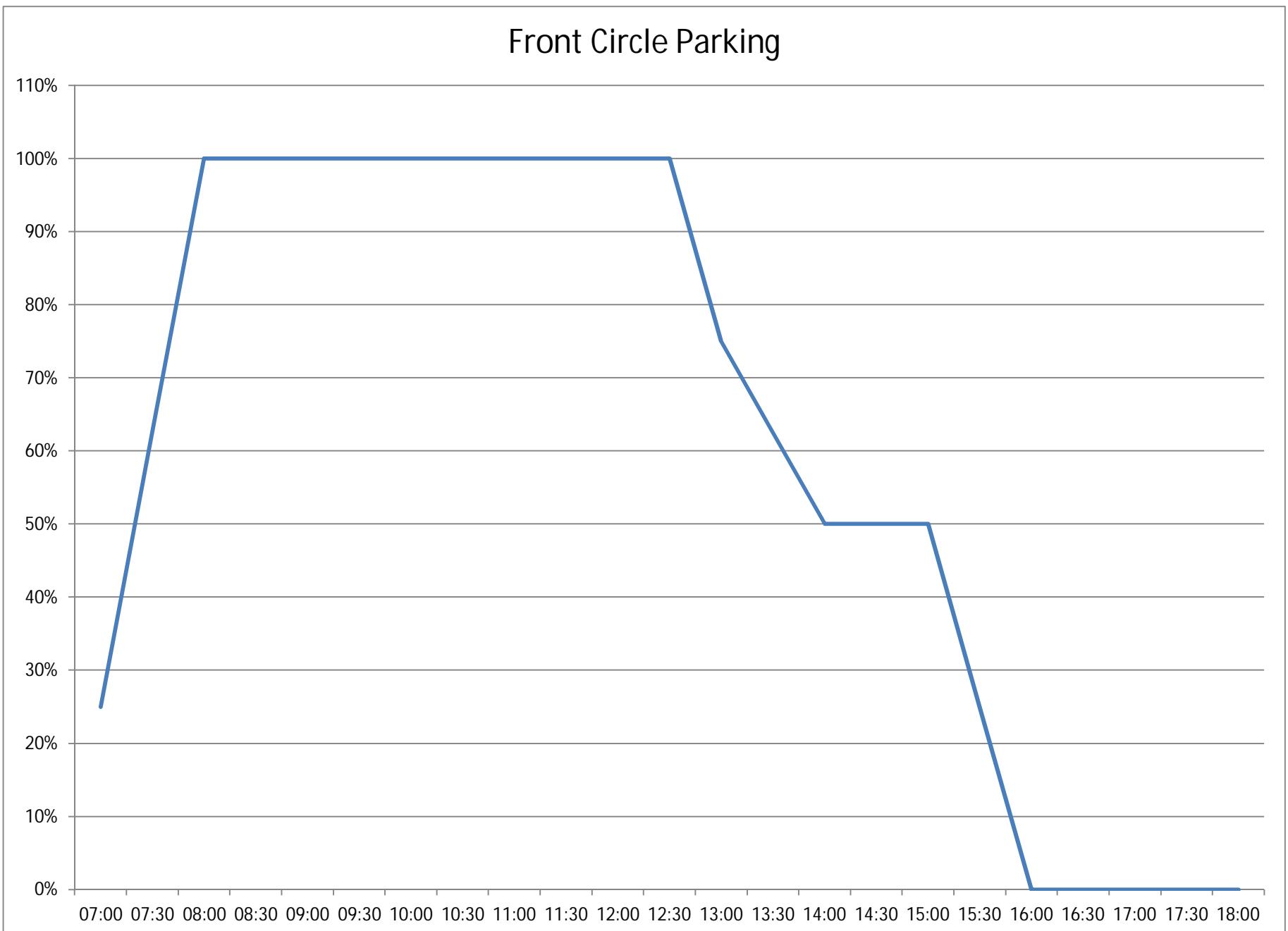
Vehicles seemed to mostly belong to autobody on Spring St.



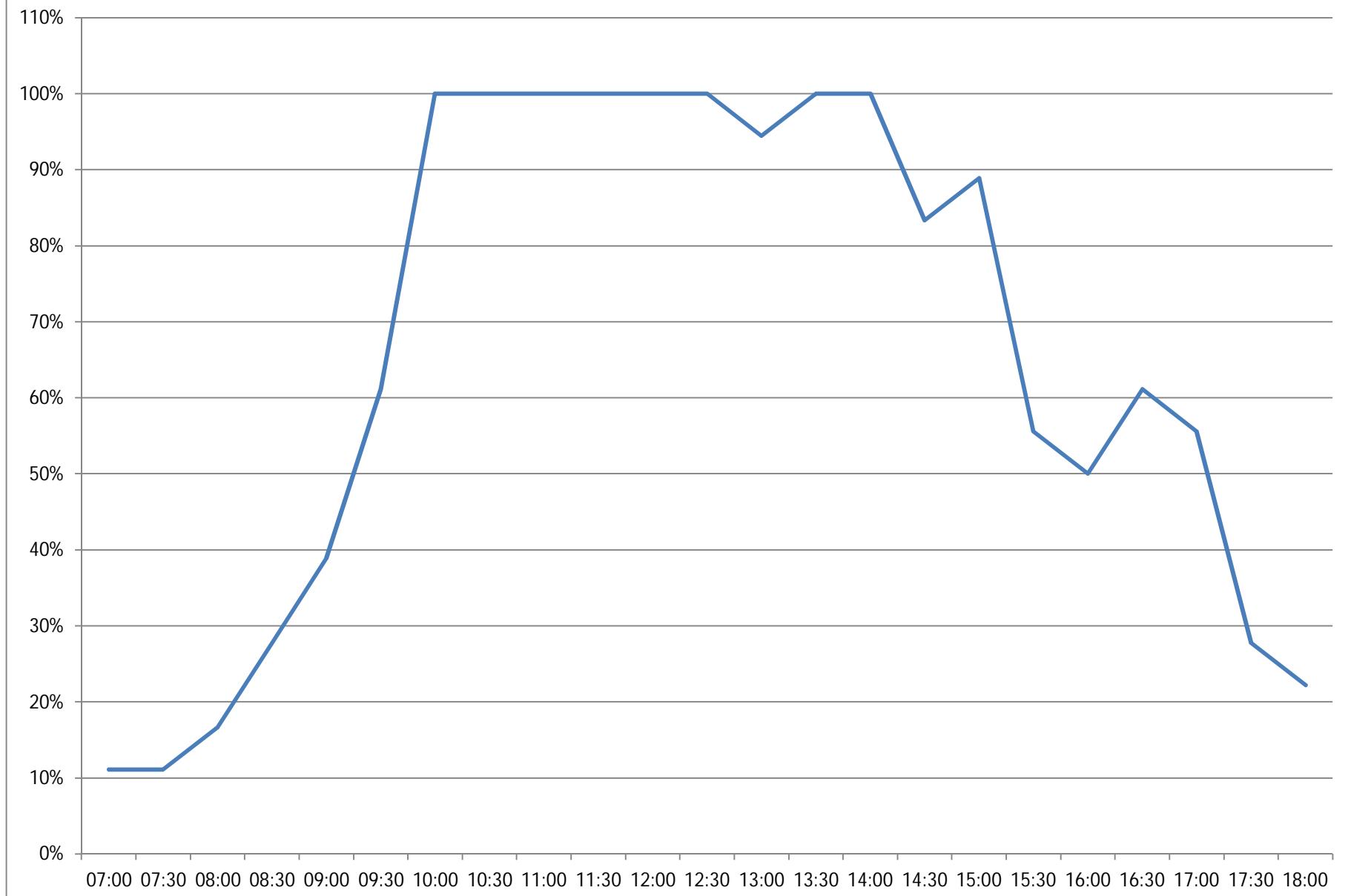




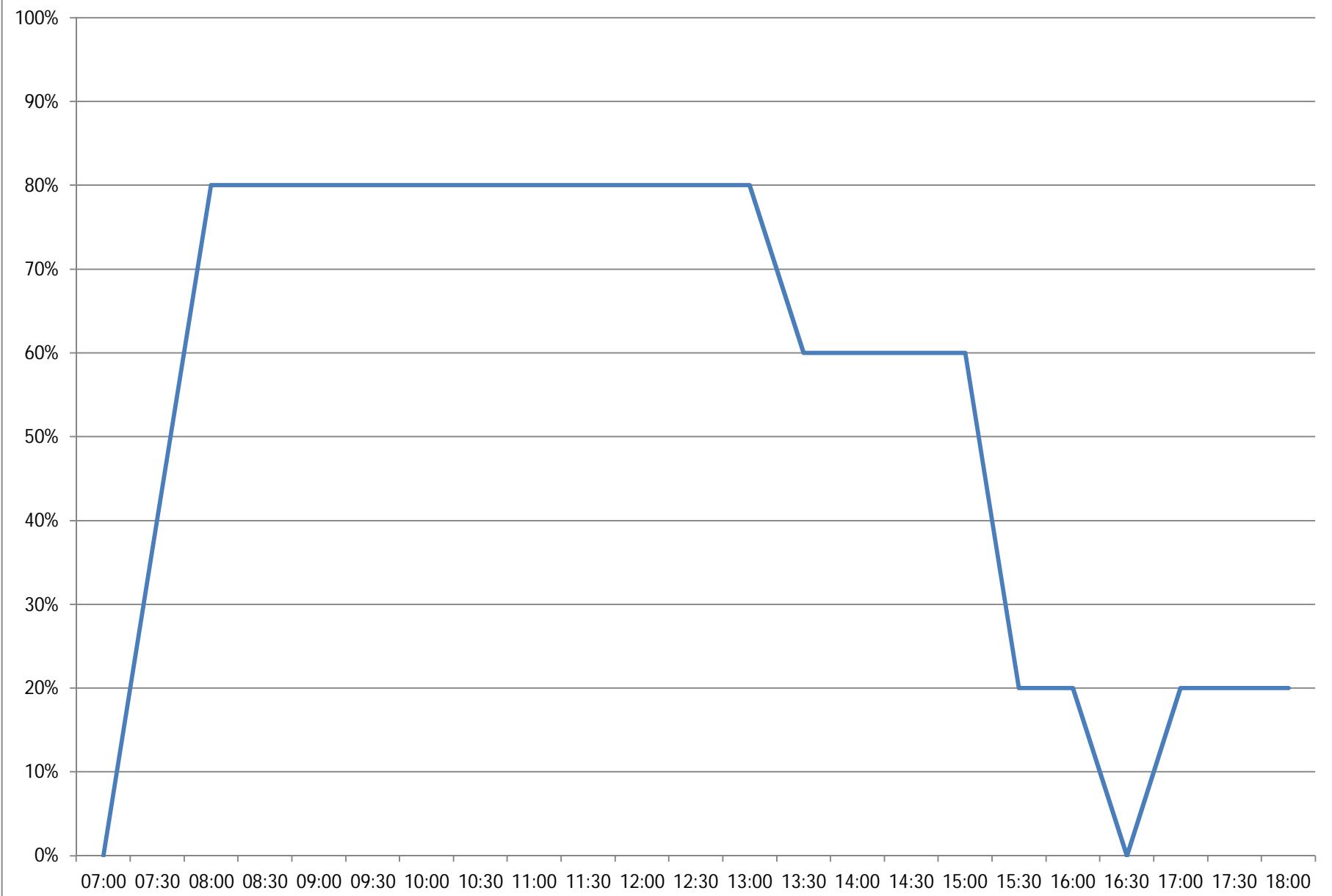




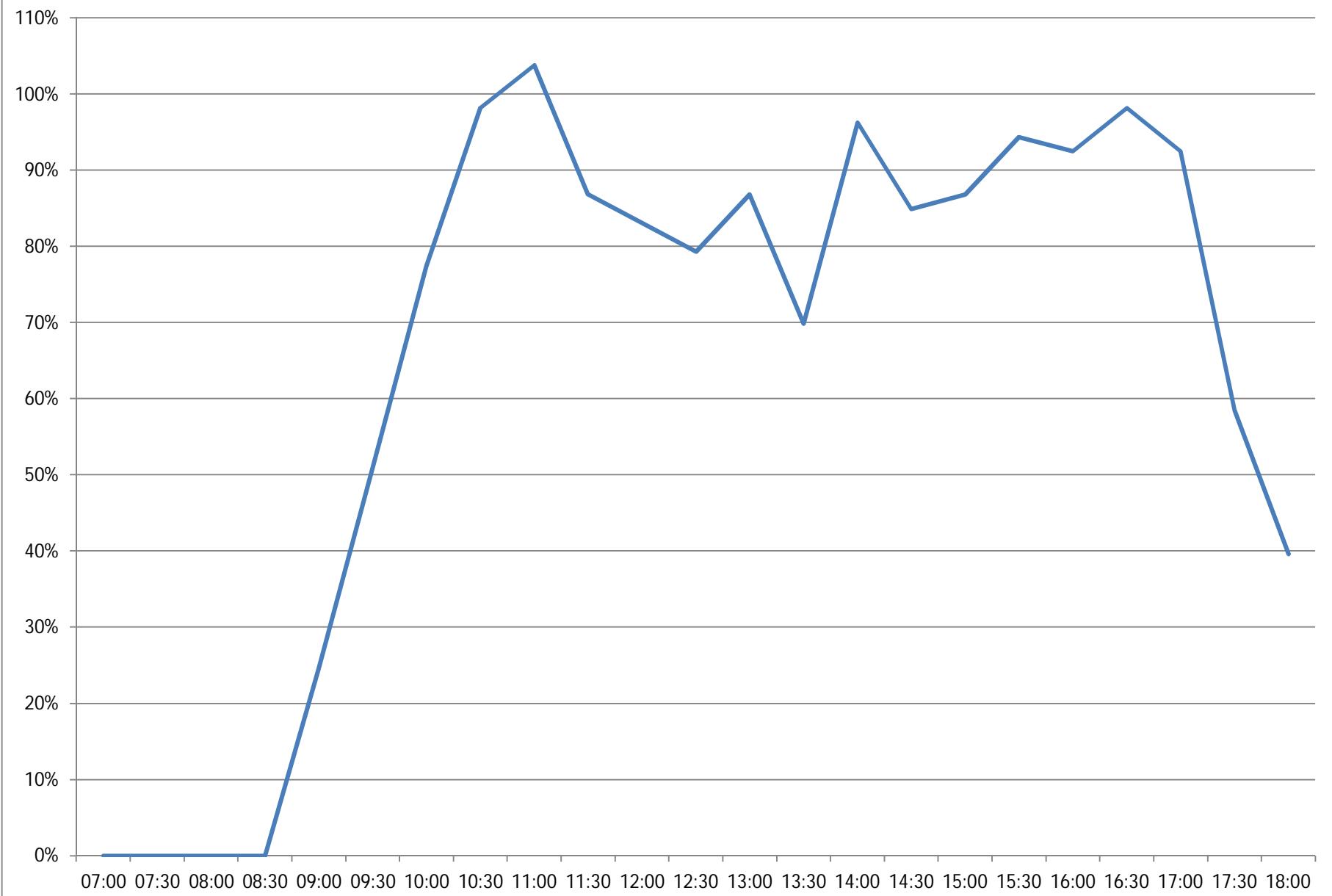
## Library Side Lot



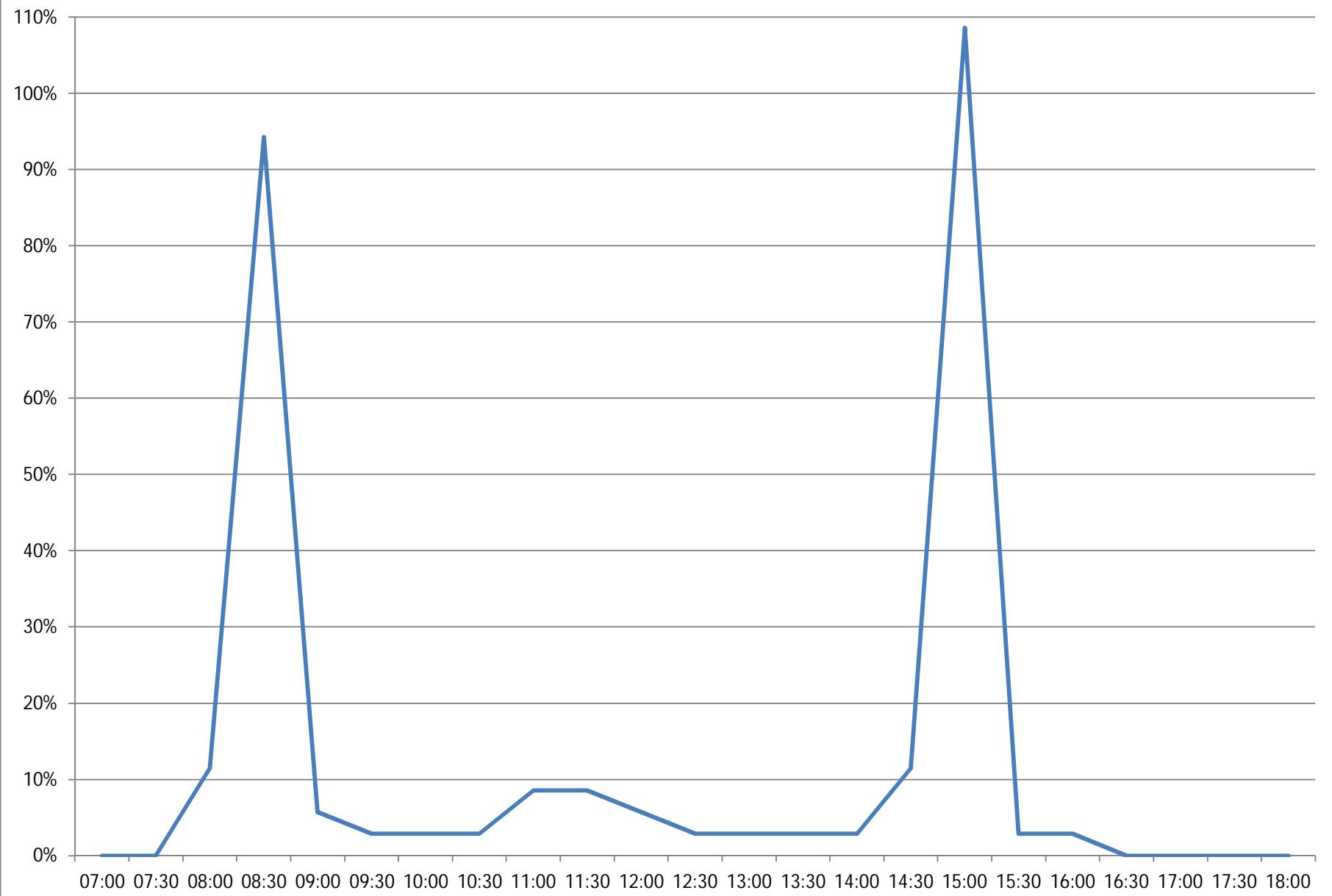
## Hunnewell Side Lot



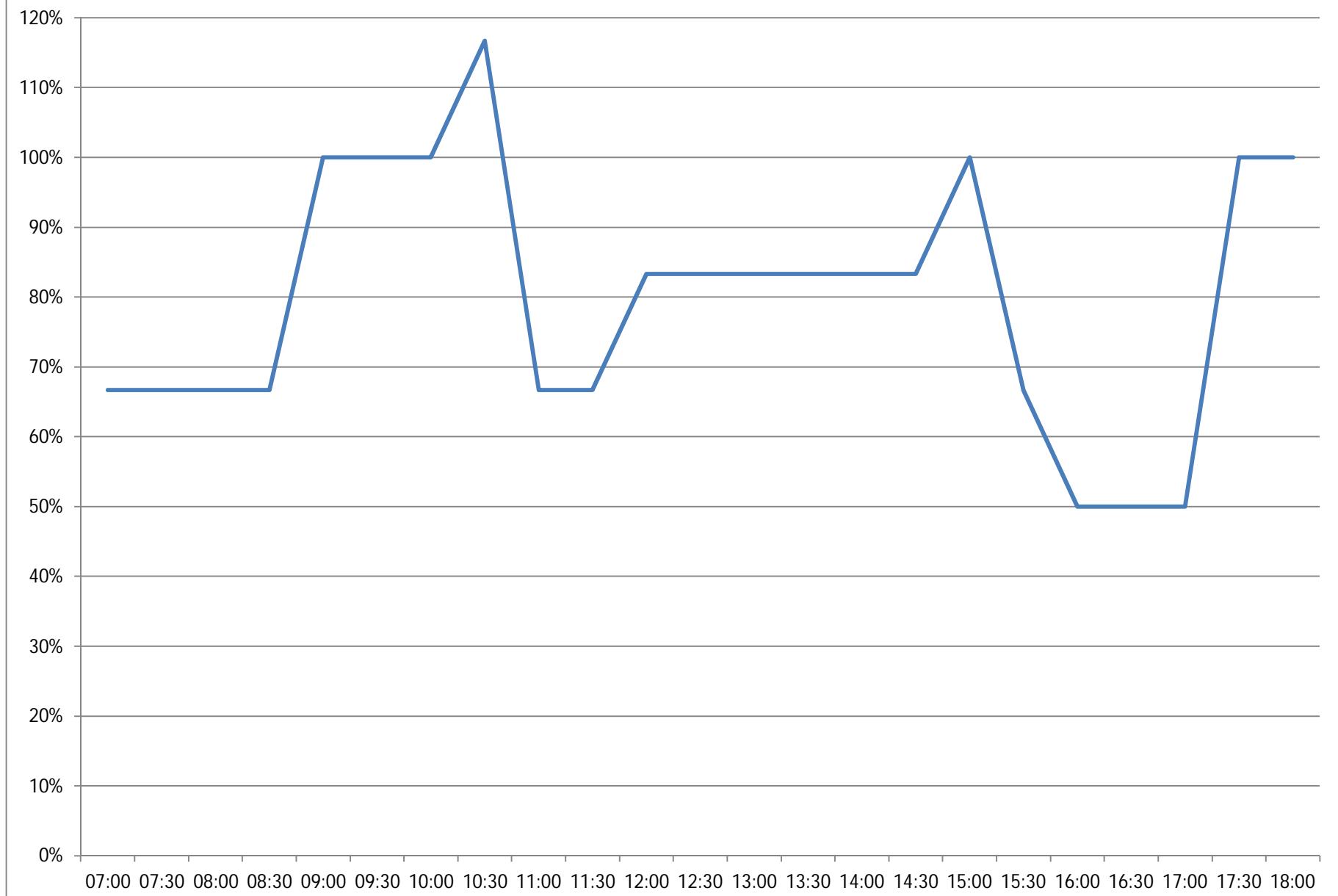
## Library Garage



## Cameron Street



## Spring Street



## APPENDIX D

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- Hunnewell School AM and PM Procedures



## Horatio H. Hunnewell Elementary School

*Wellesley Public Schools • Learning • Caring • Innovating*

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# ARRIVAL AND DISMISSAL at HUNNEWELL

DISMISSAL at HUNNEWELL

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You are here: WPS Home > Hunnewell School > Posts > News > ARRIVAL AND

**Dear Hunnewell,**

**I hope you are all enjoying your summer vacation. While we all have a few weeks left, I will be sharing updates throughout the month as we gear up for the 2017-18 school year.**

**My first bit of news will have a big impact on arrival and dismissal at Hunnewell. The Wellesley Free Library Parking Lot cannot be used as an ancillary drop-off or pick-up area. It is CLOSED to Hunnewell traffic. While our former drop-off guidelines had indicated that parents could park in the lot until 9:00am, this is no longer the case and in fact, we are never supposed to be using that lot in the afternoon. We simply had too many people using the lot and the library employees and customers were not able to find parking. Unfortunately, I also received several complaints about unsafe parking and driving practices too.**

**The Wellesley Public Library is a good neighbor and in keeping with our C.A.R.E. values, we need to honor that the Wellesley Free Library Parking Lot is ONLY for employees and customers. Please carefully read and follow the Hunnewell Drop-off and Pick-up Rules. These rules are intended to keep everyone safe during these heavy traffic times.**

**Thank you for your support and cooperation.**

**Sincerely,**

**Ellen**

## MORNING DROP-OFF

**The curb between the two circular driveways IS THE ONLY DESIGNATED LIVE DROPOFF ZONE! Make sure your child is ready to exit the vehicle promptly. If you need to park your car, see below.**

- Pull ahead as far as you can to make room for cars in line behind you.

- **Pull your car completely to the curb before discharging passengers.**
- **Drivers MAY NOT get out of their car for any reason; this holds up traffic flow.**
- **Children exit from the curb-side of the car ONLY.**
- **Pulling around a car that is unloading students is prohibited!**

## AFTERNOON PICK-UP

The curbs between the two circular driveway entrances are a **NO STOPPING ZONE** from 2:45-3:30pm. This is a school bus zone **ONLY**. Sitting in your car and waiting for your child to come out of school is **NOT OKAY**. The bus needs clear access to this area and when it has to maneuver around idling or parked cars, it creates a safety hazard and holds up traffic flow behind the bus.

Remember, you can help decrease traffic congestion at school by forming carpools and/or walking with neighbors. Parents with fourth and fifth graders are encouraged to drop-off and pick-up their children at a pre-designated meeting point off Cameron Street. This can promote independence and reduce congestion on Cameron Street.

## PARKING RESTRICTIONS

- **The library parking lot is off-limits at ALL TIMES for drop-off at and pick-up from Hunnewell.**
- **The circular driveway is closed from 8:15AM – 3:15PM.**
- **Crosswalks and fire hydrants must be kept clear at ALL TIMES.**

## WHERE CAN I PARK?

**Cameron Street: Park along the playground fence or beyond the circular driveway area. Parking is prohibited on the opposite side of the street to allow for emergency vehicle passage. Parking is also not allowed in the private lots across from Hunnewell. You may be ticketed.**

**Cameron Street Town Lot: Each Hunnewell family receives two parking passes allowing up to 30 minutes of parking in this lot. These are for the hourly spaces only. Display the pass on your front dashboard. Located beyond the school on the right.**

**Hampden Street: north side only (closest to Hunnewell).**

**Brook Street: east side only (between Amherst Road and the Methodist church). Avoid parking too close to the crosswalk as this makes it difficult for children to see and be seen.**

 Amy Ritterbusch

 August 8, 2017

 News

← 2016-17 Reflection

Nothing so constant as change →

## APPENDIX E

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- **Safety Analysis**
  - **Crash Data**
  - **Crash Rates**

Crash Number	Crash Date	Crash Severity	Crash Time	Number of Vehicles	Driver Contributing Factor/Condition	Passenger Contributing Factor/Condition	Road Surface Condition	Street Number	Roadway Name	Near Intersection	Roadway Distance and Direction From Intersection Landmark	Distance and Direction From Landmark		
A42891	10/29/2015	Property damage only (none injured)	4:41 PM	2	D1:(No improper driving) / D2:(Other improper action)		Collision with motor vehicle in traffic	Angle	Dry	WASHINGTON STREET / GROVE STREET	GROVE STREET	75 feet E of		
4107442	11/03/2015	Property damage only (none injured)	7:36 PM	2	D1:(Failed to yield right of way) / D2:(No improper driving)		Collision with motor vehicle in traffic	Dark - lighted roadway	Angle	Dry	WASHINGTON STREET / WASHINGTON ST	GROVE ST / WASHINGTON ST		
4232340	08/16/2016	Property damage only (none injured)	7:05 PM	2	D1:(No improper driving) / D2:(Failed to yield right of way)		Collision with motor vehicle in traffic	Daylight	Angle	Dry	27	GROVE ST		
4542303	07/16/2015	Property damage only (none injured)	7:44 AM	2	D1:(No improper driving) / D2:(Other improper driving) / D3:(Other improper action)		Collision with motor vehicle in traffic	Daylight	Angle	Dry	572	WASHINGTON ST		
4208831	08/26/2015	Property damage only (none injured)	6:44 AM	2	D1:(No improper driving) / D2:(Failure to yield too closely)		Collision with motor vehicle in traffic	Daylight	Rear-end	Dry		CENTRAL ST / GROVE ST		
4176914	04/10/2016	Property damage only (none injured)	11:54 AM	2	D1:(Unknown) / D2:(No improper driving)		Collision with motor vehicle in traffic	Daylight	Rear-end	Dry		WASHINGTON ST / GROVE ST		
4357472	04/19/2017	Property damage only (none injured)	8:06 PM	2	D1:(No improper driving) / D2:(Inattention)		Collision with motor vehicle in traffic	Daylight	Rear-end	Dry		WASHINGTON ST / GROVE ST		
4288732	11/11/2015	Property damage only (none injured)	12:59 PM	2	D1:(No improper driving) / D2:(Failure to keep in proper lane or running off road)		Collision with motor vehicle in traffic	Daylight	Rear-end	Wet	555	WASHINGTON ST	CENTRAL ST	
4369372	05/17/2017	Property damage only (none injured)	12:59 PM	2	D1:(No improper driving) / D2:(Inattention)		Collision with motor vehicle in traffic	Daylight	Rear-end	Dry		CENTRAL ST Rte 155 E / GROVE ST		
4144977	08/21/2017	Property damage only (none injured)	2:14 PM	2	D1:(No improper driving) / D2:(Unknown)		Collision with motor vehicle in traffic	Daylight	Rear-end	Dry	555	WASHINGTON STREET Rte 16 W	WASHINGTON STREET	
3995352	07/16/2015	Property damage only (none injured)	2:49 AM	2	D1:(No improper driving) / D2:(Failure to keep in proper lane or running off road)		Collision with motor vehicle in traffic	Daylight	Sideswipe, same direction	Dry		WASHINGTON STREET / GROVE ST		
4005405	02/04/2015	Property damage only (none injured)	7:01 PM	2	D1:(Failure to keep in proper lane or running off road) / D2:(No improper driving)		Collision with motor vehicle in traffic	Dark - lighted roadway	Sideswipe, same direction	Wet		WASHINGTON ST Rte 16 W / CENTRAL ST		
4024542	03/06/2015	Property damage only (none injured)	6:59 PM	2	D1:(Unknown) / D2:(No improper driving)		Collision with motor vehicle in traffic	Dark - lighted roadway	Sideswipe, same direction	Dry		WASHINGTON STREET / GROVE STREET		
4208830	07/06/2015	Property damage only (none injured)	7:23 PM	2	D1:(No improper driving) / D2:(Operating vehicle in erratic, reckless, careless, negligent or aggressive manner)		Collision with motor vehicle in traffic	Dark - lighted roadway	Sideswipe, same direction	Dry		WASHINGTON STREET / GROVE ST		
4058640	07/08/2015	Property damage only (none injured)	7:45 PM	2	D1:(No improper driving) / D2:(Operating vehicle in erratic, reckless, careless, negligent or aggressive manner)		Collision with motor vehicle in traffic	Daylight	Sideswipe, same direction	Dry	571	WASHINGTON ST Rte 16 E		
4101283	10/27/2015	Property damage only (none injured)	6:41 PM	2	D1:(No improper driving) / D2:(Visibility obstructed)		Collision with motor vehicle in traffic	Daylight	Sideswipe, same direction	Dry	2	CENTRAL ST		
4248880	11/11/2015	Property damage only (none injured)	1:20 AM	2	D1:(No improper driving) / D2:(Failure to keep in proper lane or running off road)		Collision with motor vehicle in traffic	Daylight	Sideswipe, same direction	Dry	571	WASHINGTON ST Rte 16 W		
4273209	10/30/2016	Property damage only (none injured)	9:43 AM	2	D1:(Unknown) / D2:(Unknown)		Collision with motor vehicle in traffic	Daylight	Sideswipe, same direction	Dry	555	WASHINGTON ST Rte 16 W	GROVE ST	
4282501	11/12/2016	Property damage only (none injured)	2:55 PM	2	D1:(Unknown) / D2:(Unknown)		Collision with motor vehicle in traffic	Daylight	Sideswipe, same direction	Dry	16	GROVE ST		
4287008	11/11/2016	Property damage only (none injured)	3:00 PM	2	D1:(No improper driving) / D2:(Failure to keep in proper lane or running off road)		Collision with motor vehicle in traffic	Daylight	Sideswipe, same direction	Dry	555	WASHINGTON ST		
4232900	11/11/2016	Property damage only (none injured)	12:21 PM	2	D1:(Unknown) / D2:(Failure to keep in proper lane or running off road)		Collision with motor vehicle in traffic	Daylight	Sideswipe, same direction	Dry	570	WASHINGTON ST Rte 16 E		
3995818	1/12/2015	Property damage only (none injured)	10:59 AM	2	D1:(No improper driving) / D2:(Made an improper turn) / Failure to keep in proper lane or running off road)		Collision with motor vehicle in traffic	Daylight	Angle	Dry		WASHINGTON ST / CAMERON ST		
4008412	1/26/2015	Property damage only (none injured)	8:08 AM	2	D1:(No improper driving) / D2:(Failure to yield right of way)		Collision with motor vehicle in traffic	Daylight	Angle	Dry		WASHINGTON ST Rte 16 E / CAMERON ST		
4053911	6/12/2015	Property damage only (none injured)	4:32 PM	2	D1:(Failed to yield right of way) / D2:(No improper driving)		Collision with motor vehicle in traffic	Daylight	Angle	Dry	539	WASHINGTON ST / WASHINGTON ST		
4071080	10/20/2015	Property damage only (none injured)	3:51 PM	2	D1:(Inattention) / D2:(No proper speed control)		Collision with motor vehicle in traffic	Daylight	Angle	Dry		WASHINGTON STREET Rte 16 E		
4053499	9/20/2015	Property damage only (none injured)	3:39 PM	2	D1:(Inattention) / D2:(Failure to yield right of way)		Collision with motor vehicle in traffic	Daylight	Angle	Dry		CAMERON STREET	CAMERON STREET	
4115474	11/25/2015	Non-fatal injury	11:27 AM	2	D1:(No improper driving) / D2:(Failure to yield right of way)		Collision with motor vehicle in traffic	Daylight	Angle	Dry		WASHINGTON ST		
4371716	6/1/2017	Property damage only (none injured)	7:37 AM	2	D1:(Failed to yield right of way) / D2:(No improper driving)		Collision with motor vehicle in traffic	Daylight	Angle	Dry	571	WASHINGTON ST Rte 16 E / CAMERON ST		
4042932	11/11/2015	Property damage only (none injured)	1:34 AM	2	D1:(No improper driving) / D2:(Failure to keep in proper lane or running off road)		Collision with motor vehicle in traffic	Daylight	Rear-end	Wet		WASHINGTON ST Rte 16 E / CAMERON ST		
4421371	9/1/2017	Property damage only (none injured)	2:37 PM	2	D1:(No improper driving) / D2:(Failure to keep in proper lane or running off road)		Collision with motor vehicle in traffic	Daylight	Rear-end	Dry	542	WASHINGTON ST		
4367591	5/23/2017	Property damage only (none injured)	11:13 AM	2	D1:(No improper driving) / D2:(Made an improper turn)		Collision with motor vehicle in traffic	Daylight	Sideswipe, same direction	Dry		WASHINGTON ST / CAMERON ST		
4365442	5/23/2017	Property damage only (none injured)	1:24 PM	2	D1:(No improper driving) / D2:(Made an improper turn)		Collision with motor vehicle in traffic	Daylight	Sideswipe, same direction	Dry	543	WASHINGTON ST / CAMERON ST		
4368657	1/10/2017	Property damage only (none injured)	12:43 PM	2	D1:(No improper driving) / D2:(Failure to keep in proper lane or running off road)		Collision with parked motor vehicle	Daylight	Sideswipe, same direction	Dry	3	CAMERON ST		
4374644	6/16/2017	Property damage only (none injured)	10:28 AM	2	D1:(Other improper action)		Collision with parked motor vehicle	Daylight	Sideswipe, same direction	Dry	539	WASHINGTON ST		
4232903	11/11/2016	Property damage only (none injured)	10:09 AM	2	D1:(Failure to yield right of way) / D2:(Failed to yield right of way)		Collision with parked motor vehicle	Daylight	Sideswipe, same direction	Dry		WASHINGTON ST / CAMERON ST		
4449278	11/2/2017	Property damage only (none injured)	11:51 AM	2	D1:(Unknown)		Collision with other light pole or other object	Daylight	Single vehicle crash	Dry	542	WASHINGTON ST		
4061514	7/9/2015	Non-fatal injury	4:33 PM	2	D1:(Inattention) / Failed to yield right of way) / D2:(No improper driving)		Collision with motor vehicle in traffic	Daylight	Angle	Dry		BROOK ST / WELLESLEY AVE		
4075660	8/18/2015	Property damage only (none injured)	10:57 AM	2	D1:(No improper driving) / D2:(Unknown)		Collision with motor vehicle in traffic	Daylight	Angle	Dry		WELLESLEY AVE / BROOK ST		
4098023	10/20/2015	Property damage only (none injured)	7:39 PM	2	D1:(No improper driving) / D2:(Failed to yield right of way)		Collision with motor vehicle in traffic	Dark - lighted roadway	Angle	Dry		WELLESLEY AVE Rte 135 E / BROOK ST		
4207003	10/20/2015	Property damage only (none injured)	7:41 PM	2	D1:(No proper speed control) / D2:(Failure to yield right of way)		Collision with motor vehicle in traffic	Daylight	Angle	Dry		WELLESLEY AVE / BROOK ST		
4212363	6/29/2016	Property damage only (none injured)	10:52 AM	2	D1:(Unknown) / D2:(No proper driving)		Collision with motor vehicle in traffic	Daylight	Angle	Dry		BROOK ST / WELLESLEY AVE		
4215407	7/9/2016	Property damage only (none injured)	3:47 PM	2	D1:(No proper driving) / D2:(Failed to yield right of way)		Collision with motor vehicle in traffic	Daylight	Angle	Dry		WELLESLEY AVE / BROOK ST		
4245247	10/24/2016	Property damage only (none injured)	3:44 PM	2	D1:(No proper driving) / D2:(Failed to yield right of way)		Collision with motor vehicle in traffic	Daylight	Angle	Dry		WELLESLEY AVE / BROOK ST		
4302724	12/23/2016	Property damage only (none injured)	1:38 PM	2	D1:(No proper driving) / D2:(Failed to yield right of way)		Collision with motor vehicle in traffic	Daylight	Angle	Dry		WELLESLEY AVE Rte 135 E / BROOK ST		
4386191	6/30/2017	Non-fatal injury	2:52 PM	2	D1:(No proper driving) / D2:(Inattention)		Collision with motor vehicle in traffic	Daylight	Angle	Dry	534	WASHINGTON ST Rte 16 W		
4418438	3/6/2017	Non-fatal injury	3:04 PM	2	D1:(No proper driving) / D2:(Failed to yield right of way)		Collision with motor vehicle in traffic	Daylight	Angle	Dry		WELLESLEY AVE / BROOK ST		
4203930	10/20/2015	Property damage only (none injured)	9:44 AM	2	D1:(No proper driving) / D2:(Failure to yield right of way)		Collision with motor vehicle in traffic	Daylight	Rear-end	Dry		WASHINGTON ST Rte 16 W / WELLESLEY AVE Rte 135 W		
4035039	4/21/2015	Property damage only (none injured)	10:33 AM	2	D1:(No proper driving) / D2:(Inattention)		Collision with motor vehicle in traffic	Daylight	Rear-end	Dry		6 WELLESLEY AVE		
4046837	5/20/2015	Property damage only (none injured)	9:00 AM	2	D1:(No proper driving) / D2:(Distracted)		Collision with motor vehicle in traffic	Daylight	Rear-end	Dry		WELLESLEY AVE / WASHINGTON ST		
4042143	10/20/2015	Property damage only (none injured)	9:38 AM	2	D1:(No proper driving) / D2:(Inattention)		Collision with motor vehicle in traffic	Daylight	Rear-end	Dry		WELLESLEY AVE Rte 135 E / WELLESLEY AVE Rte 135 W		
4113510	11/21/2015	Property damage only (none injured)	1:34 AM	2	D1:(Inattention)		Collision with parked motor vehicle	Daylight	Rear-end	Dry	533	WASHINGTON ST		
4137511	1/19/2016	Property damage only (none injured)	5:07 PM	2	D1:(No proper driving) / D2:(Inattention)		Collision with motor vehicle in traffic	Dark - lighted roadway	Rear-end	Dry		WELLESLEY AVE / BROOK ST		
4202442	10/20/2015	Property damage only (none injured)	2:27 PM	2	D1:(No proper driving) / D2:(Inattention)		Collision with motor vehicle in traffic	Daylight	Rear-end	Dry		WELLESLEY AVE Rte 135 E / BROOK ST		
4252014	9/18/2016	Property damage only (none injured)	4:39 PM	2	D1:(No proper driving) / D2:(Inattention)		Collision with motor vehicle in traffic	Daylight	Rear-end	Dry		WASHINGTON ST Rte 16 E / WELLESLEY AVE		
4273208	10/27/2016	Property damage only (none injured)	3:10 PM	2	D1:(No proper driving) / D2:(Followed too closely)		Collision with motor vehicle in traffic	Daylight	Rear-end	Wet		6 WELLESLEY AVE		
4444843	11/12/2015	Property damage only (none injured)	2:21 AM	2	D1:(No proper driving) / D2:(Failure to keep in proper lane or running off road)		Collision with motor vehicle in traffic	Daylight	Sideswipe, opposite direction	Dry		WASHINGTON ST Rte 16 W / WELLESLEY AVE Rte 135 W		
4109995	11/12/2015	Property damage only (none injured)	2:26 PM	2	D1:(No proper driving) / D2:(Unknown)		Collision with motor vehicle in traffic	Daylight	Sideswipe, same direction	Dry	534	WASHINGTON ST		
4350038	4/8/2017	Property damage only (none injured)	2:36 PM	2	D1:(No proper driving) / D2:(No proper driving)		Collision with motor vehicle in traffic	Daylight	Sideswipe, same direction	Dry	534	WASHINGTON ST		
4028853	4/2/2015	Property damage only (none injured)	12:18 PM	2	D1:(No proper driving) / D2:(Distraeted)		Collision with motor vehicle in traffic	Daylight	Rear-end	Dry		BROOK STREET / HAMPTON STREET		
4034372	4/20/2015	Property damage only (none injured)	9:16 AM	2	D1:(Unknown) / D2:(No proper driving)		Collision with motor vehicle in traffic	Daylight	Rear-end	Wet		HAMPTON ST / BROOK ST		
429786	8/2/2016	Property damage only (none injured)	4:34 PM	2	D1:(No proper driving) / D2:(Distraeted)		Collision with motor vehicle in traffic	Daylight	Angle	Dry		BROOK ST / HAMPTON ST		
401708	2/25/2015	Property damage only (none injured)	4:47 PM	2	D1:(No proper driving) / D2:(Failed to yield right of way)		Collision with motor vehicle in traffic	Daylight	Angle	Dry		GROVE ST / HAMPTON ST		
4007909	2/12/2015	Property damage only (none injured)	4:47 PM	2	D1:(No proper driving) / D2:(No proper driving)		Collision with motor vehicle in traffic	Daylight	Sideswipe, same direction	Snow	30	GROVE STREET		
4208145	6/10/2016	Property damage only (none injured)	4:14 PM	2	D1:(No proper driving) / D2:(Inattention)		Collision with parked motor vehicle	Daylight	Angle	Dry	30	GROVE ST		
4231050	8/10/2016	Property damage only (none injured)	4:31 PM	2	D1:(No proper driving) / D2:(Distraeted)		Collision with parked motor vehicle	Daylight	Sideswipe, same direction	Wet	30	GROVE ST / SPRING ST		
4261339	12/7/2016	Property damage only (none injured)	4:27 PM	2	D1:(Inattention) / D2:(No proper driving)		Collision with motor vehicle in traffic	Daylight	Rear-end	Dry	35	GROVE ST		25 feet S of

## INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : WELLESLEY COUNT DATE : \_\_\_\_\_ Sep 2018

DISTRICT : 6 UNSIGNALIZED :  SIGNALIZED :  X

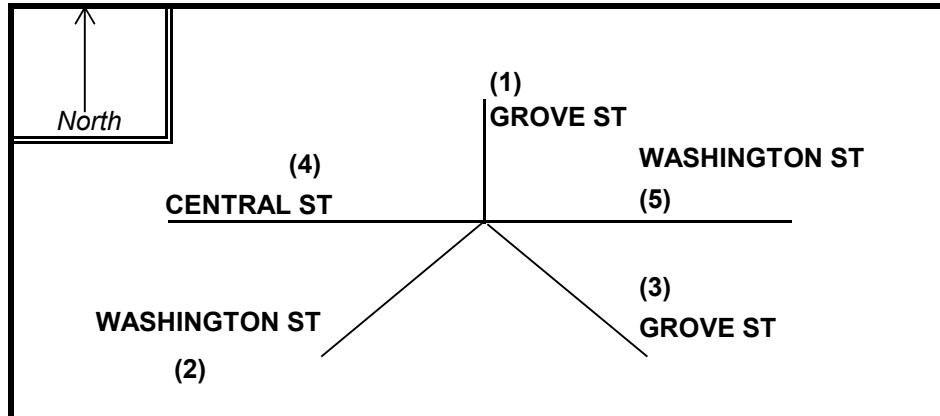
### ~ INTERSECTION DATA ~

MAJOR STREET : CENTRAL STREET

MINOR STREET(S) : WASHINGTON STREET

GROVE STREET

INTERSECTION  
DIAGRAM  
(Label Approaches)



### PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	SB	NB	NWB	EB	WB	
PEAK HOURLY VOLUMES (AM/PM) :	66	459	190	765	564	2,044

"K" FACTOR :  INTERSECTION ADT (V) = TOTAL DAILY APPROACH VOLUME :

TOTAL # OF CRASHES :  # OF YEARS :  AVERAGE # OF CRASHES PER YEAR (A) :

CRASH RATE CALCULATION :  RATE = 
$$\frac{(A * 1,000,000)}{(V * 365)}$$

Comments : MassDOT Default K Factor = 0.09 MassDOT Statewide Avg: 0.78 D6 Avg: 0.71

Project Title & Date: 6188 Wellesley - Hunnewell School 11-Feb-20



## INTERSECTION CRASH RATE WORKSHEET

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CITY/TOWN : WELLESLEY COUNT DATE : Oct 2018

DISTRICT : 6 UNSIGNALIZED :  SIGNALIZED :  **X**

**~ INTERSECTION DATA ~**

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MAJOR STREET : WASHINGTON STREET

MINOR STREET(S) : CAMERON STREET

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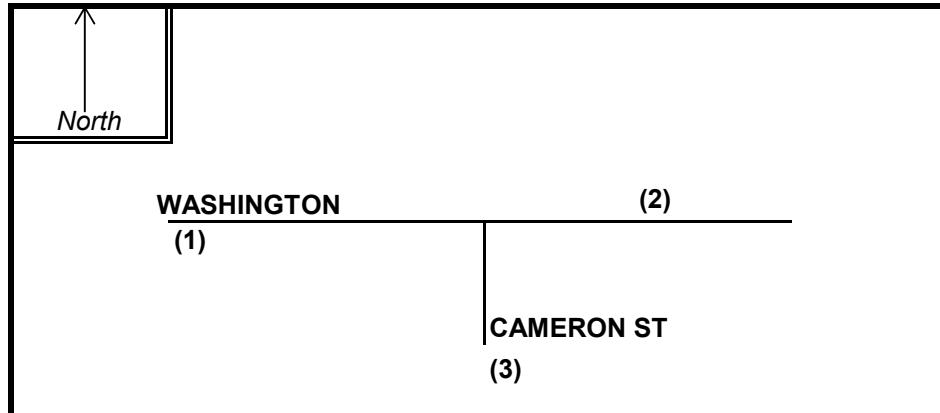


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**INTERSECTION**

**DIAGRAM**

(Label Approaches)



**PEAK HOUR VOLUMES**

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB			
PEAK HOURLY VOLUMES (AM/PM) :	1,212	685	74			1,971

"K" FACTOR :  INTERSECTION ADT (V) = TOTAL DAILY APPROACH VOLUME :

TOTAL # OF CRASHES :  # OF YEARS :  AVERAGE # OF CRASHES PER YEAR (A) :

CRASH RATE CALCULATION :  RATE = 
$$\frac{(A * 1,000,000)}{(V * 365)}$$

Comments : MassDOT Default K Factor = 0.09 MassDOT Statewide Avg: 0.78 D6 Avg: 0.71

Project Title & Date: 6188 Wellesley - Hunnewell School 11-Feb-20



## INTERSECTION CRASH RATE WORKSHEET

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CITY/TOWN : WELLESLEY COUNT DATE : Oct 2018

DISTRICT : 6 UNSIGNALIZED :  SIGNALIZED :

**~ INTERSECTION DATA ~**

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MAJOR STREET : WASHINGTON STREET

MINOR STREET(S) : LIBRARY DRIVE

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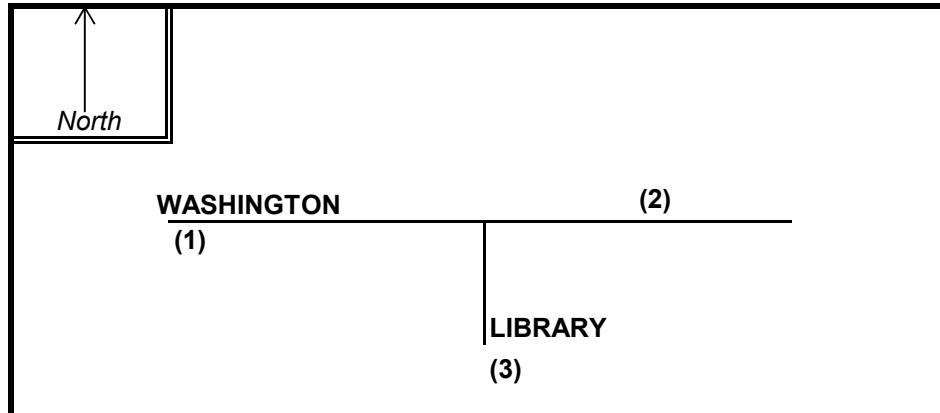


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**INTERSECTION  
DIAGRAM  
(Label Approaches)**



**PEAK HOUR VOLUMES**

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB			
PEAK HOURLY VOLUMES (AM/PM) :	1,271	685	13			1,969

"K" FACTOR :	<b>0.090</b>	INTERSECTION ADT (V) = TOTAL DAILY APPROACH VOLUME :	<b>21,878</b>
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TOTAL # OF CRASHES :	<b>2</b>	# OF YEARS :	<b>3</b>	AVERAGE # OF CRASHES PER YEAR (A) :	<b>0.67</b>
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**CRASH RATE CALCULATION :** **0.08**      RATE = 
$$\frac{(A * 1,000,000)}{(V * 365)}$$

Comments : MassDOT Default K Factor = 0.09    MassDOT Statewide Avg: 0.57    D6 Avg: 0.52

Project Title & Date: 6188 Wellesley - Hunnewell School      11-Feb-20

## INTERSECTION CRASH RATE WORKSHEET

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CITY/TOWN : WELLESLEY COUNT DATE : Dec 2016

DISTRICT : 6 UNSIGNALIZED :  SIGNALIZED :  **X**

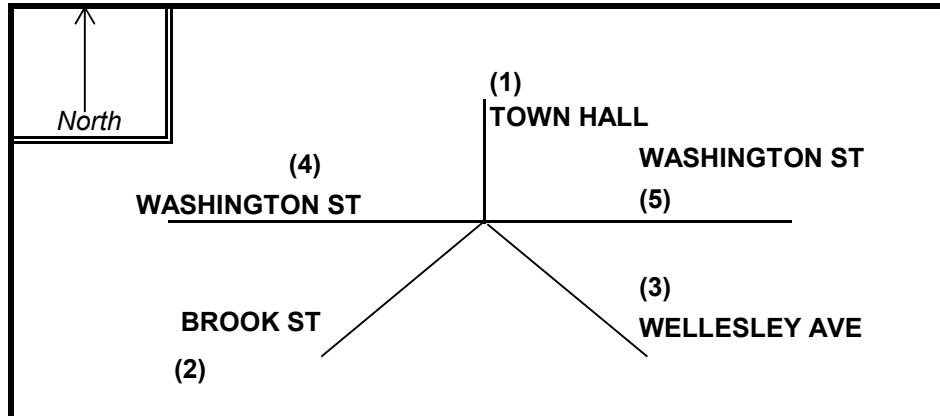
**~ INTERSECTION DATA ~**

MAJOR STREET : WASHINGTON STREET

MINOR STREET(S) : WELLESLEY AVENUE

BROOK STREET

INTERSECTION  
DIAGRAM  
(Label Approaches)



**PEAK HOUR VOLUMES**

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	SB	NB	NWB	EB	WB	
PEAK HOURLY VOLUMES (AM/PM) :	0	89	399	1,288	360	2,136

"K" FACTOR : **0.090** INTERSECTION ADT (V) = TOTAL DAILY APPROACH VOLUME : **23,733**

TOTAL # OF CRASHES : **22** # OF YEARS : **3** AVERAGE # OF CRASHES PER YEAR (A) : **7.33**

CRASH RATE CALCULATION : **0.85** RATE = 
$$\frac{(A * 1,000,000)}{(V * 365)}$$

Comments : MassDOT Default K Factor = 0.09 MassDOT Statewide Avg: 0.78 D6 Avg: 0.71

Project Title & Date: 6188 Wellesley - Hunnewell School 11-Feb-20



## INTERSECTION CRASH RATE WORKSHEET

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CITY/TOWN : WELLESLEY COUNT DATE : \_\_\_\_\_ Sep 2018

DISTRICT : 6 UNSIGNALIZED :  SIGNALIZED :

**~ INTERSECTION DATA ~**

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MAJOR STREET : BROOK STREET

MINOR STREET(S) : HAMPDEN STREET

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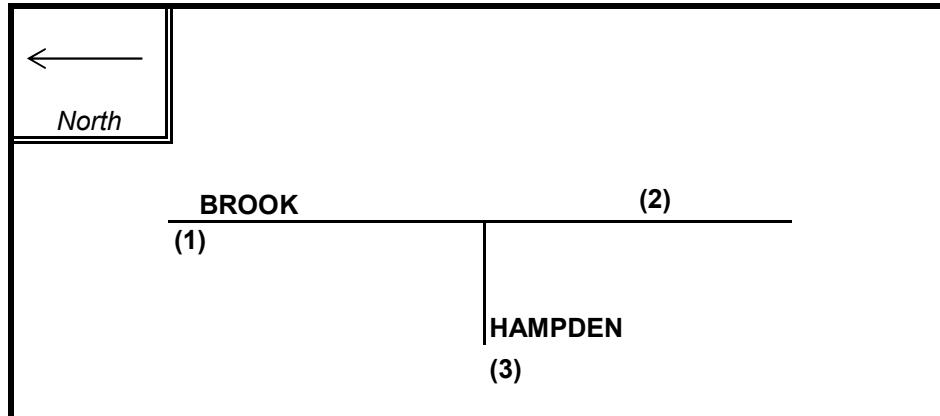


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**INTERSECTION**

**DIAGRAM**

(Label Approaches)



**PEAK HOUR VOLUMES**

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	SB	NB	EB			
PEAK HOURLY VOLUMES (AM/PM) :	115	206	191			512

"K" FACTOR :	<b>0.090</b>	INTERSECTION ADT (V) = TOTAL DAILY APPROACH VOLUME :	<b>5,689</b>
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TOTAL # OF CRASHES :	<b>3</b>	# OF YEARS :	<b>3</b>	AVERAGE # OF CRASHES PER YEAR (A) :	<b>1.00</b>
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**CRASH RATE CALCULATION :** **0.48**      RATE = 
$$\frac{(A * 1,000,000)}{(V * 365)}$$

Comments : MassDOT Default K Factor = 0.09    MassDOT Statewide Avg: 0.57    D6 Avg: 0.52

Project Title & Date: 6188 Wellesley - Hunnewell School      11-Feb-20



## INTERSECTION CRASH RATE WORKSHEET

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CITY/TOWN : WELLESLEY COUNT DATE : \_\_\_\_\_ Sep 2018

DISTRICT : 6 UNSIGNALIZED :  SIGNALIZED :

**~ INTERSECTION DATA ~**

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MAJOR STREET : HAMPDEN STREET

MINOR STREET(S) : CAMERON STREET

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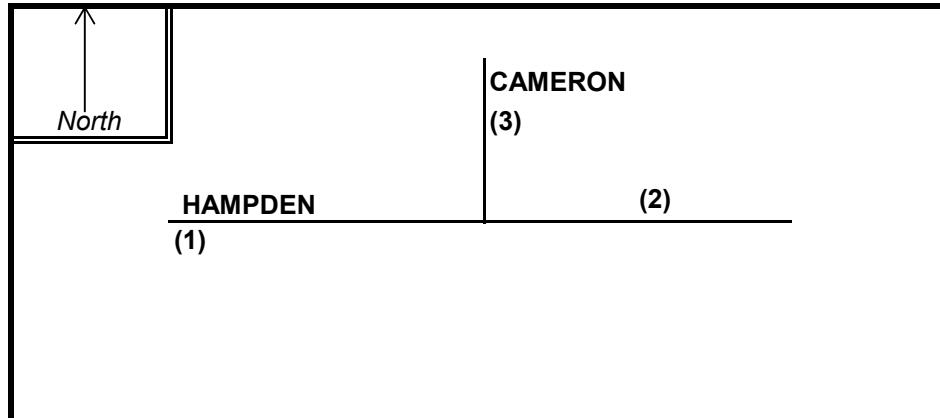


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**INTERSECTION  
DIAGRAM  
(Label Approaches)**



**PEAK HOUR VOLUMES**

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	SB			
PEAK HOURLY VOLUMES (AM/PM) :	288	239	16			543

"K" FACTOR :	<b>0.090</b>	INTERSECTION ADT (V) = TOTAL DAILY APPROACH VOLUME :	<b>6,033</b>
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TOTAL # OF CRASHES :	<b>0</b>	# OF YEARS :	<b>3</b>	AVERAGE # OF CRASHES PER YEAR (A) :	<b>0.00</b>
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**CRASH RATE CALCULATION :** **0.00**      RATE = 
$$\frac{(A * 1,000,000)}{(V * 365)}$$

Comments : MassDOT Default K Factor = 0.09    MassDOT Statewide Avg: 0.57    D6 Avg: 0.52

Project Title & Date: 6188 Wellesley - Hunnewell School      11-Feb-20



## INTERSECTION CRASH RATE WORKSHEET

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CITY/TOWN : WELLESLEY COUNT DATE : \_\_\_\_\_ Sep 2018

DISTRICT : 6 UNSIGNALIZED :  SIGNALIZED :

**~ INTERSECTION DATA ~**

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MAJOR STREET : GROVE STREET

MINOR STREET(S) : SPRING STREET

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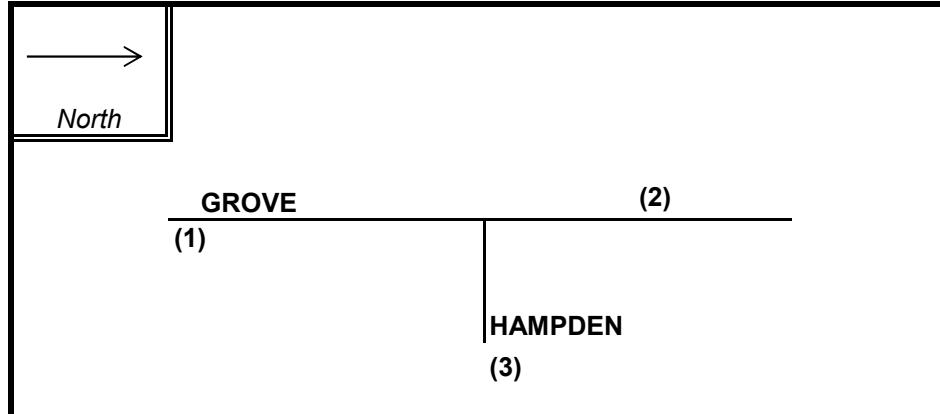


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**INTERSECTION**

**DIAGRAM**

(Label Approaches)



**PEAK HOUR VOLUMES**

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	WB			
PEAK HOURLY VOLUMES (AM/PM) :	449	110	101			660

"K" FACTOR :  INTERSECTION ADT (V) = TOTAL DAILY APPROACH VOLUME :

TOTAL # OF CRASHES :  # OF YEARS :  AVERAGE # OF CRASHES PER YEAR (A) :

CRASH RATE CALCULATION :  RATE = 
$$\frac{(A * 1,000,000)}{(V * 365)}$$

Comments : MassDOT Default K Factor = 0.09 MassDOT Statewide Avg: 0.57 D6 Avg: 0.52

Project Title & Date: 6188 Wellesley - Hunnewell School 11-Feb-20



## INTERSECTION CRASH RATE WORKSHEET

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CITY/TOWN : WELLESLEY COUNT DATE : \_\_\_\_\_ Sep 2018

DISTRICT : 6 UNSIGNALIZED :  SIGNALIZED :

**~ INTERSECTION DATA ~**

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MAJOR STREET : GROVE STREET

MINOR STREET(S) : SPRING STREET

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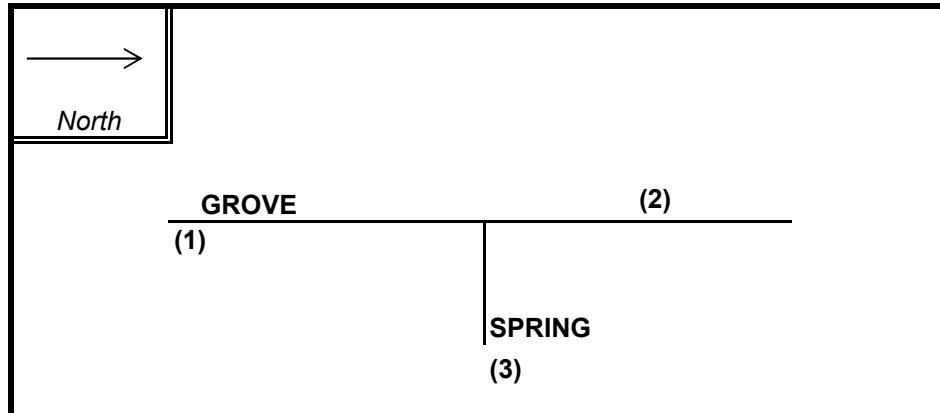


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**INTERSECTION**

**DIAGRAM**

(Label Approaches)



**PEAK HOUR VOLUMES**

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	WB			
PEAK HOURLY VOLUMES (AM/PM) :	136	124	146			406

" K " FACTOR :

**0.090**

INTERSECTION ADT ( V ) = TOTAL DAILY APPROACH VOLUME :

**4,511**

TOTAL # OF CRASHES :

**4**

# OF YEARS :

**3**

AVERAGE # OF CRASHES PER YEAR ( A ) :

**1.33**

**CRASH RATE CALCULATION :**

**0.81**

RATE = 
$$\frac{(A * 1,000,000)}{(V * 365)}$$

Comments : MassDOT Default K Factor = 0.09 MassDOT Statewide Avg: 0.57 D6 Avg: 0.52

Project Title & Date: 6188 Wellesley - Hunnewell School

11-Feb-20

## Average Crash Rates, per Million Entering Vehicles, by Intersection Type

(Based upon crash information queried on June 26, 2018)

Location	Signalized Intersections	Unsignalized Intersections
Statewide	0.78	0.57
District 1*	0.80*	0.44*
District 2	0.89	0.62
District 3	0.89	0.61
District 4	0.73	0.57
District 5	0.75	0.57
District 6	0.71	0.52

\* - District 1 should use Statewide Rates due to low sample total

## 2016 Average Crash Rates, per Million Vehicle Miles Traveled, by Federal Functional Classification

(Based upon crash information queried on June 22, 2018)

Roadway Federal Functional Classification	Rural	Urban
Statewide	0.99	2.27
Interstate	0.42	0.62
Principal arterial - other freeways and expressways	0.64	0.79
Principal arterial - other	0.53	3.49
Minor arterial	1.07	3.80
Major collector	1.57	3.58*
Minor collector	2.46	-
Local	1.25	2.24

### Notes on Functional Classification Data:

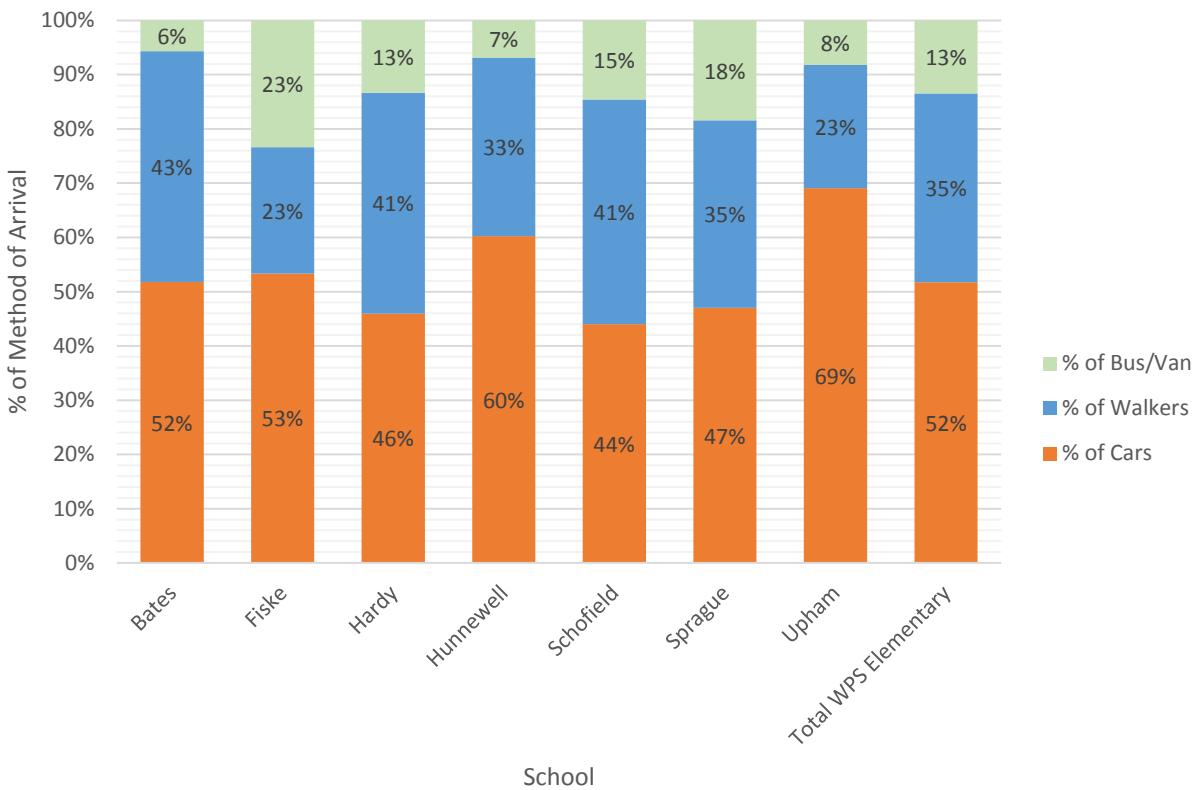
- \* This rate is for all Urban Collector roads, including both Urban Major Collector and Urban Minor Collector roadways.
- If a crash occurred at an intersection or along two different functional classifications, the crash was assigned to the higher order roadway.

## APPENDIX F

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- **2016 Mode Split Survey**

### Three Day Average: Methods of Arrivals to Wellesley Elementary Schools - September 2016



### Three Day Average: Methods of Dismissals from Wellesley Elementary Schools - September 2016

